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Paper Chemistry Institute to Hold Conference

More Than 100 Chief Executives of Paper Companies to Attend—Marinette to Receive Pulp Shipments — D. C. Everest, Vice-President and General Manager of Marathon Paper Mills Co., Addresses the Banquet.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 31, 1937—The second annual executives' conference sponsored by the Institute of Paper Chemistry affiliated with Lawrence College, Appleton, Wis., has been set for Friday and Saturday, June 4 and 5. The meetings are expected to attract a group similar to that of last year, when more than 100 chief executives of paper companies, representatives of the Institute membership, of the board of governors of the pulp and paper associations, and of the technical associations, attended sessions at the Institute.

A banquet at the North Shore Country Club will be one of the high points of the conference. The speaker will be L. A. Hawkins, executive engineer of the research laboratories of the General Electric Company. Mr. Hawkins is coordinator and business manager of all research activities at the Schenectady plants, and he will speak on "Fundamental Research in Industry, Why, What, and How?" Ernst Mahler, executive vice-president of the Kimberly-Clark Corporation, Neenah, Wis., and president of the Institute board, will preside. Ernst Behrend, one of the trustees, will be toastmaster.

Meetings will open with a tour of the Institute by the visitors Friday morning, followed by the luncheon at the North Shore club. The afternoon session will have as its chairman D. Clark Everest, vice-president and general manager of the Marathon Paper Mills Company, Rothschild, Wis. He is vice-president of the board. Talks will be given by members of the Institute staff, including Westbrook Steele, executive director, Dr. B. W. Rowland, research associate, Dr. Otto Kress, technical director and Dr. Harry F. Lewis, dean.

Saturday morning will be occupied with informal round-table discussions of various phases of the Institute's work. A luncheon will conclude the conference.

Pulp Shipments Due

Marinette, Wis., is to be the receiving point for extensive vessel shipments of pulp this summer, to be supplied mills in Wisconsin and northern Michigan. The first cargo arrived last week on the steamer *Brown Beaver*. The cargo contained 1,500 tons, and came from a point 50 miles south of Labrador on the Atlantic Coast. The Northland Fuels Company dock has been extended 350 feet to accommodate the pulp storage. A large supply of tarpaulins has been ordered to protect the pulp, coming mostly from Canada, until delivery to the mills by rail.

Praises Safety Accomplishments

Praise for the safety accomplishments of Wisconsin industries, pioneered largely by the paper industry, was expressed by Governor Philip F. LaFollette at the annual Fox River Valley and Lake Shore Safety Conference held at Oshkosh, Wis. In an address to one of the largest gatherings ever held, he said accidents have been cut 60 per cent in the state in the last twenty-five years. Wisconsin's pioneering in the enactment of the workmen's compensation law was reviewed by the governor, who said that although when proposed it met stiff opposition from many industries, it was later praised after it had been in operation. While Wisconsin, through this law, provides the highest benefits of any state to injured and disabled workers, the cost is the lowest of any because of the achievements of the safety councils.

A parade a mile long was held in the afternoon, with many floats preaching safety of various types.

One of the sectional meetings was devoted to the pulp and paper industry, and proved valuable because of its discussion of problems, and talks on successful safety methods.

D. C. Everest Addresses Paper Men

The influence of new social and labor legislation on the paper industry was the theme of an address given by D. C. Everest, vice-president and general manager of the Marathon Paper Mills Company, Rothschild, Wis., at the banquet of the Northwest division of the American Paper and Pulp Mill Superintendents Association at Conway Hotel, Appleton, Wis., May 22.

After analyzing the provisions of the new labor relations act passed by the Wisconsin legislature, and the federal social security legislation, he said little difficulty should be encountered in the administration of the laws regarding employer and employee. "When all employers and their workers become fully ac-

(Continued on page 25)

Paper Credit Men To Meet In Chicago

Will Present Interesting Program At Stevens Hotel June 21-24—Chicago Paper Market Quiet Since Prices Began To Show Advances — Western Paper Merchants Association Announces New Officers and Committees.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., June 1, 1937—The Paper Products and Converters group of the National Association of Credit Men expects to play an important part in the seventh credit congress of the industry which meets this year at the Stevens Hotel, Chicago, June 21 to 24, inclusive. According to H. L. Brunner, Central Fibre Products Company, national vice-chairman, the group sessions of the Congress are scheduled for Monday and Tuesday afternoons. General sessions of the convention will occupy all other time except for the popular "Play Day." Approximately 5,000 credit and financial executives are expected to attend the meetings with a goodly number of executives connected with the paper industry contributing to the program.

Mr. Brunner states that "attendance will bring representatives of the credit end of the paper industry in contact with credit and finance executives in every line of business, providing an opportunity for ample exchange of experiences and mutual problems."

The tentative program of the Paper Products and Convertors Group calls for assembling at 3:30 P. M. the same afternoon on Monday, June 21 with a message of welcome to be delivered by H. K. Crawford, Container Corporation of America, chairman. The initial sessions are to be devoted to the following subjects: Credit Cooperation within the Paper Industry; Effect of Credit on Current Developments Within the Paper Industry; Carrying of Customer's Stock in Warehouses and Present and Pending Bankruptcy Legislation. A luncheon meeting will feature the following day with a well known paper executive to discuss "The Present Outlook for the Paper Industry." The Tuesday afternoon discussions will feature: Modern Financing of Customers Just Entering Business; Effect of Strikes on Acceptance or Rejection of Orders and How to Prevent Failures and Build Successful Customers. Speakers on these subjects are to be announced later, according to Mr. Brunner.

Chicago Market Quiet

The past week in Chicago has been the most uneventful since the rapid rise in prices got under way. Demand is slackening and buyers are giving evidence of having filled requirements for at least the next few weeks. There are statements with respect to further strengthening of the sulphite market and additional news on this market was expected at the close of the week. It is expected that the advances will reflect the market position of various manufacturers with the competitive picture playing a less important part. The kraft market is firm with expectations that it will increase in strength as foreign importations become reportedly less and less. The book market is firm though buying is more spotty in character. Cover continues to report a strong tone though it, in company with other markets, is more quiet than for the past few weeks. Groundwoods are unchanged over last week. The board market is firm with a good undertone contributed to by the raw material situation. No changes are reported in the waste paper market which is marked by irregularity in the structure even in the local market. Book waste is reported as the most active.

Association Lists New Officers

The Western Paper Merchants Association this week announced its 1937 list of officers, commodity committee chairman and new members. More than 70 per cent of the membership are actively serving on committees. Officers of the association are as follows: President, G. A. Mueller, Midland Zellerbach Paper Company, Chicago; first vice-president, Hamilton Vose, Jr., Bershire Papers, Inc., Chicago; second vice-president, D. A. Headley, Carpenter Paper Company, Omaha; treasurer, K. E. Hellstrom, Messinger Paper Company, Chicago; directors, R. S. Bull, Bradner Smith & Company, Chicago; L. A. Ramaker, Bauer Paper Company, Milwaukee; E. B. Schmidt, Jr., Parker, Thomas & Tucker, Chicago; J. T. Hillyer, past president, Whitaker Paper Company, Chicago and N. V. Ventriss, executive secretary and assistant treasurer.

Chairman of the commodity committees are as follows: Blotting, Charles Fisher, Blunden-Lyon Company; Book and Offset Paper, E. B. Schmidt, Jr., Bristols, Boards, Blanks, Tags, E. D. Buchanan, Moser Paper Company; Cover and Text, William White, James White Paper Company; Envelope, Leo P. Golisch, Whitaker Paper Company; Groundwood, News, Specialties, G. E. (Bert) Carpenter, Carpenter Paper Company, Omaha; Membership, James M. Abell, J. W. Butler Paper Company; Merchandising and Survey, W. N. Gillett, Chicago Paper Company; Traffic, Roy W. Campbell, Butler Paper Corporation; Writing Paper, W. T. Shea, Bradner, Smith & Co.

Interstate Golf Outing Planned

Chicago and Illinois Fine Paper merchants have been invited by Wisconsin Fine Paper merchants to be their guests for a day of golf and entertainment in Milwaukee on Wednesday, June 23, at the Westmoor Country Club.

Roger Little, of Dwight Brothers Paper Company of Milwaukee, is chairman of the committee in charge of this day's festivities and has stated that the objectives of this event are to create a better understanding between Illinois and Wisconsin merchants and to give merchants an opportunity to get better acquainted with competitors.

Wisconsin merchants are offering $100.00 worth of prizes and it is expected that competition will run high. This will be an all-day affair. Luncheon and dinner will be served. At the latter prizes will be awarded to the winners.

Chicago and Illinois merchants have returned the invitation and Wisconsin merchants will be their guests in Chicago for a similar event in July.

THEY'LL BEHAVE ...with this

This is the "pyro-point" instrument with which the Texaco engineer learns the skin temperature of each bearing, before specifying the proper grade Taurak.

You can have cool-running, trouble-free open bearings, but to do so, you must use lubricant selected for your bearing. No one grade of lubricant can cover the wide range of working temperatures found in open bearings.

Due to this, Texaco now offers Taurak . . . in three different grades.

To ascertain the right grade for a given bearing, the Texaco man takes pyrometric readings of it. This known, he can specify the exact grade of Taurak for the specific temperature. Many lubricants drag out of open bearings, waste away . . . glaze over, fail to lubricate.

Taurak Greases make open bearings behave because they lubricate effectively. Trained lubrication engineers are available for consultation on the selection and application of Texaco Petroleum Products. Prompt deliveries assured through 2020 warehouse plants throughout the United States. The Texas Company, 135 East 42nd Street, New York City.

TEXACO *Industrial Lubricants*

Paper Mills Display Products In Boston

International Paper Co., S. D. Warren Co., Appleton Coated Paper Co. and Others Exhibit Variety of Papers In Boston — Overstock Bulletin Provokes Favorable Comment — Moderate Volume of Paper Is Moving.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 31, 1937—A good number of paper manufacturers displayed products at the Direct Mail and Graphic Arts Exposition, held at the Hotel Statler May 24-26. The S. D. Warren Company showed a variety of papers, including examples of half-tone printing, solid color and overprint varnish on Warren's Cumberland Gloss and Warren's New England Gloss. Each half-tone (three in each piece) was printed twice to give a comparison between the result obtained with a glossy varnish ink and the result obtained with a dull ink. Other manufacturers exhibiting included the Gilbert Paper Company, which showed samples of ingredients used in making paper. Products of this company are distributed by the Andrews Paper Company, with Lancaster Bond distributed by Carter, Rice & Co., Corp. The International Paper Company, whose booth was in charge of the local distributors, noted their names, including the Arnold Roberts Company, John Carter & Company, Inc., Carter, Rice & Co., Corp., Cook-Vivian Company, Inc., Knight, Allen & Clark, Inc., and Storrs & Bement Company. The company also noted the papers carried by each concern. The Appleton Coated Paper Company's booth listed the Arnold Roberts Company, Knight, Allen & Clark, Inc., and Storrs & Bement Company as distributors, and the Rising Paper Company listed Carter, Rice & Co., Corp., Cook-Vivian Company, Inc., and Storrs & Bement.

Clock Represents Mill Connections

A feature of the Carter Rice exhibit was a clock, which was running, with each hour representing a line of mill connections, including Oxford Papers, Strathmore Papers, Falpaco Blanks, Crocker-McElwain Papers, International Paper, Hammermill Papers, U. S. Envelopes, Nation Wide Papers, Crane's Papers, Linton's Bristols, Eagle-A Papers and Rising's Papers. In connection with the clock was the legend, "Save Time! with our complete paper service." Carter Rice showed a wide range of papers, manufactured by nationally known mills, stating: "complete warehouse stocks available for prompt delivery to the printer. Samples and dummies made to your specification from any of our papers quickly furnished." The Carter Rice booth was immediately adjoining that of the Oxford Paper Company, national exhibitors.

Storrs & Bement Company showed Art-O-Graphic Envelopes, which carried pictures in various solid colors and white, Worthy Papers in printed sheets and swatches, and product stamps of McLaurin Jones Company.

There were also printed papers from various countries.

The show was very well attended, with exhibitors expressing satisfaction.

Overstock Bulletin

The Overstock Bulletin issued from the office of the New England Paper Merchants Association has provoked very favorable comment from the trade. There are three benefits from this service: The Bulletin focuses executives' attention on overstock items, it offers an orderly procedure for moving those items at satisfactory prices, and stimulates the salesmen to try to sell these items listed by their own houses. The service is free to members of the New England Paper Merchants Association. Non-members are welcome to list items, but a service charge of 5 per cent will be made on sales or purchases to help cover expense.

Paper Moves in Moderate Volume

Paper in the wholesale market here moved in moderate volume during the last week. Some dealers in the fine paper division noted a fair demand and others a fairly good one, although within the last few weeks there has been a decline in the amount of orders. Similar conditions prevailed in the wrapping paper division. Box board was quiet, as box manufacturers were not very active. The shoe box run is ended, but demand for cartons of this kind is expected to resume late in July. Some irregularity in prices of chip board was reported.

Paper Stock Market Fair

A fair market ruled in paper stock, with some lines, however, not moving so well. Some grades of old papers dropped in price. No. 1 kraft declined to 1.75 from 1.90 @ 2.00, mixed papers to .62½ @ .65 from .60 @ .65, corrugated boxes to .75 @ .85 from .85 @ .90, and kraft corrugated boxes to 1.60 from 1.60 @ 1.65, all f.o.b., Boston. A number of grades of bagging also went down in price. Foreign manila rope eased off to 4.25 @ 4.50 from 4.75 @ 5.00, domestic manila rope to 4.75 @ 5.00 from 5.00 @ 5.30, jute rope to 2.00 @ 2.25 from 2.50 @ 2.75, and soft jute strings to 2.00 @ 2.50 from 2.75 @ 3.00. In some quarters, foreign gunny is quoted at 2.40 @ 2.50, compared with a former price of 2.50 @ 2.60, although foreign gunny is reported to be held abroad at 2.30 @ 2.40. There was weaker tendency on foreign gunny here, with buyers wanting to buy at lower figures. Domestic gunny declined to 1.90 @ 2.00 from 2.10 @ 2.15, bleachery burlap to 4.00 @ 4.25 from 4.25 @ 4.50, and Australian wool pouches to 3.00 @ 3.25 from 3.25 @ 3.30. All bagging prices are f.o.b., Boston. There was a little better feeling in new domestic rags, with values sustained at the same levels. Old domestic rags held steady. In foreign rags, dark cottons declined to 1.75 @ 1.85 from 1.90 @ 2.00 and old fustians to 2.50 @ 2.75 from 2.85 @ 3.00, both f.o.b., Boston.

George M. Graves Co. Moves

The George M. Graves Company, Inc., paper stock dealers, have removed their offices to 161 Summer street, Gahm Building, from 77 Summer street. Their telephone number is Hancock 6729-30.

New Paper Mill at Crossett Is Model Unit

Venture Is Started To Utilize More Efficiently the Extensive Timber Holdings of Crossett Lumber Co. — Plant Is Equipped With 210 Inch Bagley & Sewall Fourdrinier and Thoroughly Up-To-Date Equipment.

The following descriptive article, together with illustrations, was supplied by J. W. Watzek, Jr., of Crossett Watzek Gates, Chicago, Ill.

The Crossett Lumber Company made another step forward when it put into production a new mill at Crossett, Ark., for the manufacture of Kraft pulp and paper in the South. The reason for this venture is to utilize more efficiently the timber holdings of a company which was started over forty years ago by E. C. Crossett, Dr. J. W. Watzek, and C. W. Gates, three pioneers from Iowa. The first operations were located at Fordyce, Ark., and later extended to Crossett, Ark., and still later to Lockhart, Ala., and are now known as the Crossett-Watzek-Gates Industries. Reforestation was practiced soon after. The result is now very satisfactory and the indications are that the company will have sufficient timber to operate all its industries for many years to come.

Soon after the paper mill was started the company found that it would be necessary to construct several houses to take care of the newcomers in the paper industry and with this in mind 125 houses for the white population and 75 houses for the colored people were constructed. The houses are up-to-date in every respect and very comfortable. There also are schools for the white and colored population, several churches, a golf club, as well as other features of recreation, for the company has always kept in mind that the contentment of its employees is an asset well worth having.

Design and Construction

The pulp and paper mill was designed by Hardy S. Ferguson & Co., New York City. The Rust Engineering Company, Pittsburgh, Pa., constructed the plant and installed all machinery and equipment under the supervision of R. G. Seip, of Hardy S. Ferguson & Co. resident engineer. The design of this mill is unique in that it is arranged for a straight line flow of materials and readily lends itself for expansion.

Water Supply

Eight artesian wells located two miles from the mill furnish a minimum of six million gallons of good clean water per day. The water is pumped from the wells through a twenty-inch pipe and is delivered to a half million gallon concrete reservoir located in the mill yard From this reservoir the water is pumped to various parts of the mill.

Fuel and Power

The gas used for the boilers and for reburning lime sludge is furnished by the Mississippi River Fuel Corporation whose gas fields are located in Morehouse Parish, Louisiana. Electric power is furnished by the Arkansas Power and Light Company. Provisions have also been made so that the

GENERAL VIEW OF THE NEW CROSSETT PAPER MILLS, CROSSETT, ARK.

power load can be carried by the Crossett Lumber Company's power plant in case of failure of the power company.

Technical Department

The Technical Department consists of a main laboratory building, situated between the main office and the mill, a pulp testing station in the screen room, and a paper testing station in the paper mill. The laboratory is equipped to produce complete chemical and physical tests on pulp, paper, and wood using the latest design of all modern testing equipment. It is also equipped to maintain a standardized control system throughout the mill of all the processing and raw materials.

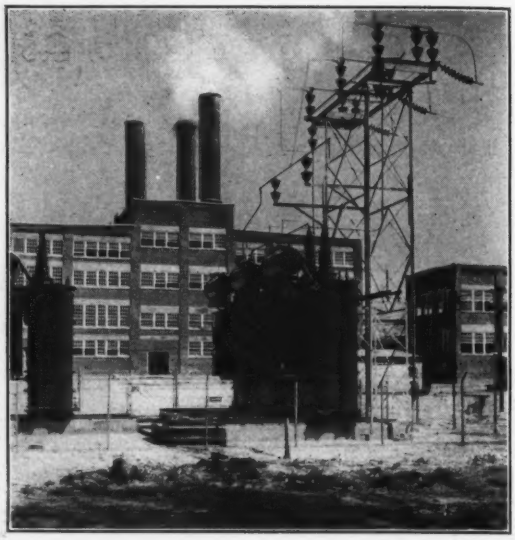
Wood Room

Pulp wood is delivered to the mill by rail or truck and is unloaded on a conveyer which discharges into a D. J. Murray barking drum. The bark is removed by a scrapper conveyor and the barked logs are delivered to D. J. Murray chipper. Logs which are not properly barked are returned to the barking drum. The chips are carried to two Orville Simpson Rotex screens. The accepted chips are discharged to a belt conveyor which delivers them to the chip bins over the digesters and the over size chips drop to a D. J. Murray dual drive roller type crusher which breaks them up and delivers them back to the screens. The sawdust drops into the same scrapper conveyor carrying the bark and carries it to the boiler house.

Digester and Diffuser Rooms

The chips are fed into four Babcock & Wilcox digesters. Yarnall Waring right angle 8 inch blow valves with cast steel sleeves and stainless steel plungers and Bailey steam flow meters and temperature and pressure recording gauges are used.

There are twelve Babcock & Wilcox diffusers. The washed stock is dumped by means of Pusey & Jones automatic dumping valves. Strong black liquor is stored in three insulated steel tanks and Weak wash



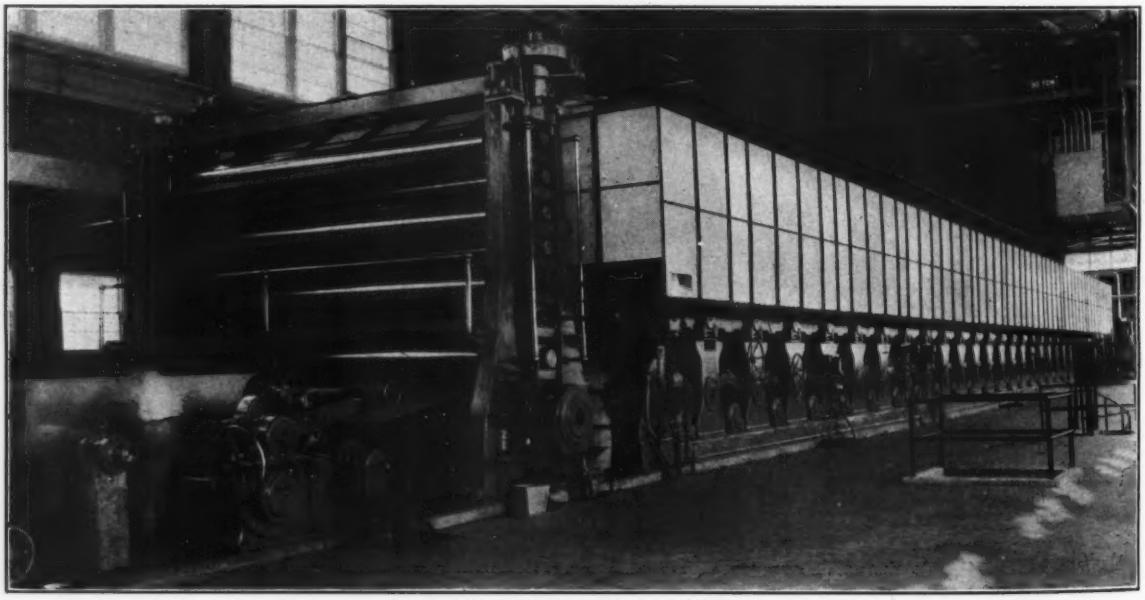
and hot water is stored in four insulated steel tanks. A surface condenser manufactured by C. H. Wheeler serves to condense the relief gases and excess steam when blowing a digester and also heats the water for washing the stock. The washed stock is dumped to a Belmer type chest beneath the diffusers.

Screening and Thickening

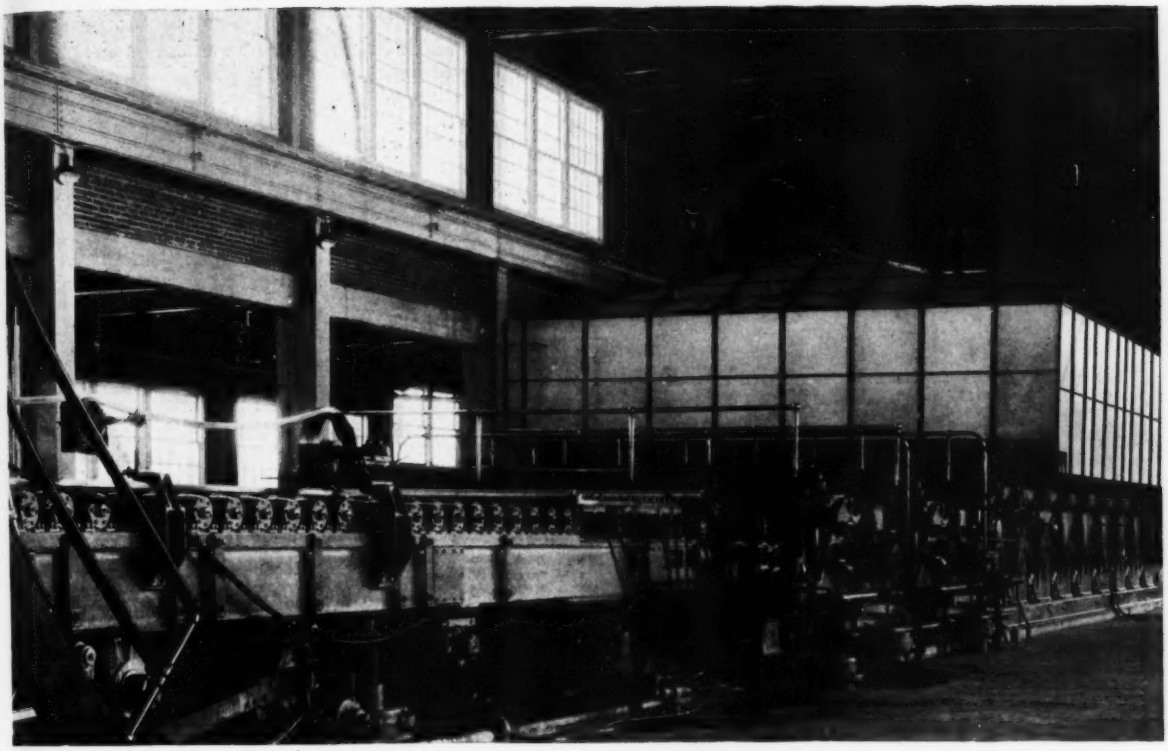
From the diffuser chests the stock is pumped to a knotter head box from which it flows by gravity through four knotter screens, six pulp screens, and finally over two vacuum thickeners. All of the screening and thickening equipment was built by the Improved Paper Machinery Company.

Stock Preparation

The stock from the thickeners drops into a chest from which it is pumped to two Appleton Vortex beaters. Additional hydrating and refining of the



210 INCH BAGLEY & SEWALL FOURDRINIER AT CROSSETT PAPER MILLS



The Crossett 210" Kraft Machine

THIS view of the 210 inch kraft machine now operating in the new Crossett mill will serve to show the general design and construction of this modern kraft machine. The machine, being built for speeds from 1200 to 1500 feet per minute, has many interesting features which make the entire installation an outstanding development of modern design.

It has been a pleasure and a privilege for our organization to have worked with the Engineering Staff of Mr. Hardy S. Ferguson, the Rust Engineering Company, and the members of the Crossett organization in bringing to completion this installation.

Bringing this mill into production in less than ten months from the date of breaking ground is evidence of the ability of all concerned, who were responsible for the completed project.

Designed and Built By

THE BAGLEY AND SEWALL COMPANY

WATERTOWN, NEW YORK

stock before it reaches the paper machine is accomplished by pumping it through six Dilts Hydrafiners and six Shartle Miami Jordans.

Paper Machine

The paper machine was built by Bagley & Sewall Company, Watertown, N. Y., and is designed to operate at speeds from 200 to 1200 feet per minute. The stock is fed to the machine through a Trimbey metering and regulating box. After dilution in the fan pump it is pumped through four Jones rotary screens into a copper lined head box equipped with a high speed slice.

The Fourdrinier is designed for a 90 foot wire 210 inches wide and is equipped with seven flat suction boxes and a Beloit suction couch roll. Regulation of the suction is accomplished by means of the Broughton vacuum control system. The Fourdrinier is constructed to permit changing a wire without removing any operating parts by a special rear cantilever construction. All table rolls are rubber covered and equipped with SKF bearings.

The press section consists of two suction presses and a smoothing press. Vacuum is furnished for the suction presses, suction couch roll and flat boxes by six Nash vacuum pumps.

The drier section consists of 50 sixty inch driers and four felt driers. The drier gears are totally enclosed and so designed as to make the back side of the machine almost as accessible as the front. Condensate from the driers is removed by the Midwest Fulton system and regulation of the drying of the paper is by means of a Foxboro temperature control valve. The heating and ventilation of the machine room was supplied and installed by the J. O. Ross Engineering Corporation.

The calendar stack consisting of eight rolls was furnished by Farrel-Birmingham and equipped with Vickery doctors and an electric lifting device.

The reel is Bagley & Sewall's latest design. The machine is also equipped with a two drum Bagley & Sewall high speed winder.

All bearings are automatically lubricated by means of a Bowser oiling and purifying system.

A 64 inch by 48 inch Dilts iron tub broke beater is located directly beneath the calendar stack of the paper machine.

The machine is driven by a sectional electric Westinghouse drive. Direct current is furnished by a 600 KW, 250 Volt, 900 RPM Westinghouse turbo-generator located in the basement.

Pulp Drying Machine

The pulp drying machine is located parallel to the paper machine on a lower level. This is a 90 inch three cylinder Beloit machine equipped with 80 thirty-six inch driers, three presses and a duplex sheet cutter.

Finishing Room

The finishing department is located in a two-story building with the second floor on the same level as the machine and the ground floor on the same level as the shipping platform. The equipment in this department consists of two Cameron rewinders, a Hamblet duplex paper cutter, and a Seybold paper trimmer. The shipping platform will accommodate ten cars. Paper is transferred from the second floor by means of a six ton elevator.

Recovery System

Strong black liquor from the diffusers first runs over two Malone filters into storage tanks. From here it is pumped to a four effect Swenson evaporator. This heavy liquor is then pumped to the recovery room where it is mixed with the proper amount of salt cake and sprayed into the Babcock & Wilcox recovery units. There are three B&W-Tomlinson recovery smelters. Two of these units are sufficient for normal production and the third is kept as a spare. Each unit is equipped with forced and induced draft fans and the operation is controlled by Bailey recording meters.

Adjacent to the Recovery units are two Babcock & Wilcox Stirling high pressure boilers. One boiler is equipped with a Hofft stoker in which the bark and sawdust from the wood room is burned.

The green liquor from the dissolving tanks is pumped to the causticising department where it is causticized in a continuous system designed and installed by the International Filter Company of Chicago. This system consists of four rectangular settling tanks in one block with single wall partitions, two mixing tanks for diluting the green liquor mud and white liquor lime sludge before it goes to its respective settling tank, a slaker classifier and three causticizing tanks. There are ample storage tanks for green liquor, white liquor and weak wash liquor. The lime sludge is pumped to two Filtration Engineer's filters which discharge the thickened mud to a vertical calcining furnace built by the Nichols Herreshoff Engineering Company. This furnace has eight horizontal hearths with revolving scraper arms which slowly remove the lime from one hearth to the other until it finally discharges at the bottom into a bucket elevator which delivers it to a storage hopper from which it is fed to the slaker classifier. Heat is supplied by thirty-six gas burners. Each hearth is equipped with a thermocouple and temperatures at each hearth are regulated and recorded.

General

All conveyer and bucket elevators were furnished by the Jeffrey Manufacturing Company.

Warren Steam Pump Company supplied all general purpose water and stock pumps; the Bingham Pump Company furnished all pumps handling liquors and high consistency stocks.

Motors, transformers and starting equipment were supplied by the Westinghouse Electric and Manufacturing Company. The wiring materials and wiring were supplied and installed by the Allegheny Industrial Electric Company, Pittsburgh, Pa.

Pittsburgh Piping and Equipment Company furnished and installed all piping throughout the mill including all underground piping for distribution of fresh water and for fire protection purposes. The steam piping is all capable of handling 450 pound pressures. Provisions were made for future connection and easy accessibility for cleaning.

Storage tanks for liquor and water were for the most part furnished by the Chicago Bridge and Iron Works. Insulation of all liquor tanks, hot water and steam pipes was supplied and installed by the Standard Asbestos and Insulating Company.

The salt cake handling system was supplied and installed by the Holly Pneumatic Systems, Inc. This provides for unloading the salt cake from the cars

and blowing it either to storage or to a hopper located in the recovery room where it is fed to a small tank and mixed with strong black liquor.

Compressed air used throughout the mill for various purposes is furnished by an air compressor supplied by Ingersoll Rand Company.

INSTITUTE TO HOLD CONFERENCE

(Continued from page 15)

quainted with the new legislation, the administration will be easy and all will profit from the new program," he said. As vice-president of the board of trustees of the Institute of Paper Chemistry at Appleton, Wis., he praised the work of that institution and reviewed some of its accomplishments.

During the afternoon golf tournament held in connection with the convention at Butte des Morts Golf Club, there was a tie for first place in low net by Jack Burnham, Menasha, Wis., and M. J. Porykaza and Robert Weber of Chicago. They all had scores of 72. H. W. Sherman, Green Bay, Wis., was next with a 73. D. H. Beisel shot an 81 in the low gross division, with R. Bauman, Green Bay, having an 83.

Members also competed in a trap shoot in which W. F. Thiel of Wisconsin Rapids, Wis., took first place. Other leaders were E. C. Jacoby, Glens Falls, N. Y., Fred Kranhold, of Appleton, Wis., and Robert Kissel, Green Bay.

The final record of registrations showed 215 members in attendance.

Dr. Barrows to be Inaugurated

Dr. Thomas N. Barrows, the new president of Lawrence College and director of the Institute of Paper Chemistry affiliated with the college, will be inaugurated Friday morning, June 11. He succeeds Dr. Henry Merritt Wriston, who resigned to take the presidency February 1 of Brown University at Providence, R. I.

Dr. Barrows will be presented by C. B. Clark, president of the Riverside Paper Corporation, Appleton, Wis., who is a member of the college board of trustees. Another of the speakers will be Ernst Mahler, executive vice-president of the Kimberly-Clark Corporation, Neenah, Wis., who is president of the board of trustees of the Institute of Paper Chemistry. He will speak on behalf of the Institute.

The ceremony will be followed by a luncheon and a reception at the president's home.

Wedding At Neenah

Miss Dorothy Brown, daughter of Mr. and Mrs. D. K. Brown of Neenah, Wis., and Stanley Severson, also of Neenah, were married Wednesday evening, May 26, at the Brown residence. The bride's father is first vice-president and general manager of the Neenah Paper Company. Mr. Severson is associated with the Banta Publishing Company of Menasha, Wis. After an extensive motor trip, the couple will reside at 215 East Doty Avenue, Neenah.

Rising Winsted Bond Portfolio

A new portfolio on Rising Winsted Bond contains large samples in the various weights as well as full line data, and has an interesting collection of letterheads produced by letterpress, offset lithography and die-stamping, covering a range of treatments. In the back are two sample envelopes converted by the Old Colony Envelope Company. Copies of this portfolio are available to readers.

R. C. Clark To Start Own Firm

Announcement by the Graham Paper Company, St. Louis, of the resignation of its sales manager, Robert C. Clark, effective June 30, was made last week. The announcement over the signature of M. J. Collins, president, follows:

"We are sorry to announce that R. C. Clark is leaving the Graham Paper Company to engage in the paper business on the Pacific Coast, where he has spent all of his life.

"Mr. Clark came to us a year and a half ago with paper experience and a knowledge of selling that

ROBERT C. CLARK

proved very valuable in promoting sales and developing men.

"We regret to lose the services of Mr. "Budge" Clark, but wish him well in his new venture."

Before going with the Graham Paper Company Mr. Clark was sales promotion manager on the headquarters staff of the Zellerbach Paper Company, San Francisco. During his twenty years service with Zellerbach Paper Company he served as manager or sales manager of the Seattle, Spokane, Oakland, San Jose, Fresno, Los Angeles, San Diego, Phoenix, and Kansas City branches, during periods of organization and reorganization.

Mr. Clark is forming his own company whose headquarters will be in San Francisco.

Pacific Paper Men Elect Officers

The Pacific States Paper Trade Association, at its twelfth annual convention at Del Monte, Cal., May 13-15 inclusive, elected the following officers:—President, Victor E. Hecht, Zellerbach Paper Company, San Francisco, Cal.; executive first vice-president, Frank E. Jeffries, Tacoma Paper & Stationery Company, Tacoma, Wash.; vice-presidents, Roy E. Banks, Long Beach Paper & Notion Company, Long Beach, Cal., E. E. Embree, Carter Rice & Co., Corp., Seattle, Wash., Wm. C. Lambert, Zellerbach Paper Company, Salt Lake City, Utah, J. W. F. McFall, Portland, Ore., and A. G. Mohn, Zellerbach Paper Company, Spokane, Wash.; secretary-treasurer, Miss Hildegard Wahl, San Francisco, Cal.; Counsel, H. Arthur Dunn, Jr., San Francisco, Calif.

Financial News of Pulp and Paper Industry

Harrison & Co. Offer New Abitibi Plan — Dryden Co. Reports Substantial Increase in Profits for First Six Months—S. D. Warren Co. Declares Dividend of 75 Cents Per Share — I. P. Co. of Newfoundland Reports.

New York Stock Exchange

High, Low and Last for the Week Ending June 2, 1937

	High	Low	Last
Armstrong Cork Co.	64	62¼	63⅞
Celotex Corp.	41	40	40
Celotex Corp., pf.	76½	76	76
Certain-Teed Products Corp.	17	15⅞	16⅜
Certain-Teed Products Corp., pf.	65½	65⅛	65⅛
Champion Paper & Fibre Co.	58¾	57½	57½
Champion Paper & Fibre Co., pf.	108	108	108
Congoleum Nairn Co.	36⅞	35¾	35¾
Container Corp. of Amer.	31¾	27¾	28⅜
Continental-Diamond Fibre Co.	20⅞	20⅛	20⅜
Crown Zellerbach Co.	20⅜	19	19⅝
Crown Zellerbach Co., cum. pf.	100⅞	98⅝	98⅝
Flintkote Co.	30¼	29½	30
International Paper & Power (a)	20	17¾	19
International Paper & Power (b)	14⅜	12⅜	13⅜
International Paper & Power (c)	7¼	6⅜	6⅞
International Paper & Power, pf.	105¾	101½	103½
Johns-Manville Corp.	130	127	127¼
Johns-Manville Corp., pf.	122	122	122
Kimberly-Clark Corp.	41⅞	41⅞	41⅞
MacAndrews & Forbes	32½	31½	31½
Masonite Corp.	56½	55	55
Mead Corp.	29	27½	29
Mead Corp., pf.	95½	94	95
Paraffine Companies, Inc.	70	70	70
Scott Paper Co.	40¾	40⅛	40½
Union Bag & Paper Corp.	77½	76	77
United Paperboard Co.	13	11⅞	12
U. S. Gypsum Co.	110	108	109¼
U. S. Gypsum Co., pf.	160	158¼	160

New York Curb Exchange

High, Low and Last for the Week Ending June 2, 1937

	High	Low	Last
American Box Board Co.	20	19½	20
Brown Co., pf.	74¾	66½	74¼
St. Lawrence Corp.	13	12	13
St. Lawrence Corp., pf.	35	33½	35
St. Regis Paper Co.	8¾	8½	8¾
St. Regis Paper Co., pf.	102¼	100	100
Taggart Corp.	11¾	11½	11½

Abitibi Consolidation

TORONTO, Ont., May 27, 1937—A new plan for reorganization of Abitibi Power and Paper Company has been offered Harrison & Co., Toronto investment dealers. The offer is independent of other attempts to terminate the present receivership.

Under the plan holders of common shares would receive warrants to purchase convertible debentures to raise $10,663,546 of new money for the company. The debentures would be underwritten by Harrison & Co., who would buy any debenture not taken up by shareholders.

Details of the offer for the various Abitibi securities now outstanding are:

1. For each $1,000 of present bonds the holder would receive $1,000 of new 5 per cent first mortgage bonds and for interest arrears, $346.59 new 5 per cent convertible general mortgage income bonds. The latter bonds would be convertible at the rate of two common shares for each $100 par value up to $10,000,000.

2. For each $100 share of 7 per cent preferred and dividend arrears, the holder would get three new common shares.

3. For each $100 share of 6 per cent preferred stock and dividend arrears, the holder would receive two and a half common shares.

4. For each eight present common shares, holders would receive one new common share.

The offer proposes holders of present common shares be given warrants to purchase convertible 6 per cent debentures, junior to the new 5 per cent bonds, with each common share entitled to buy $10 of the debentures. Each $100 of the debentures would be convertible into five new common shares.

Dryden Paper Earnings Gain

TORONTO, Ont., May 31, 1937—Dryden Paper Company, with mills at Dryden, Ont., reports a substantial increase in profits for the first six months of the current fiscal year as compared with the same period last year. Gross profits amounted to $110,635 for the six months ended March 31, 1937, as against $54,467 in the first half of the last fiscal year. Bond interest absorbed $41,640, leaving a net profit of $68,995 before depreciation. This compares with a net profit of $7,787 in the first half of the 1936 fiscal year. During the year ended September 30 last, Dryden Paper reported a total income of $182,262 and net profit, before depreciation and income taxes, $34,243. If the present trend of earnings is maintained the company will be able to cover interest, depreciation, and with something over for the common stock, of which 150,000 shares are outstanding.

S. D. Warren Earnings Higher

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 31, 1937—S. D. Warren Company, fine paper maker, has declared a dividend of 75 cents per share, payable June 28 to stock of record June 19. This compares with a dividend of 50 cents a share paid in March and with a dividend of $1 per share paid in December, the latter having been the first dividend paid since February, 1931.

Increased dividend corresponds with the uptrend in the company's earnings this year, which is in line with improving results throughout the paper industry. Earnings before federal taxes in the first quarter of this year were equal to $1.45 per share, or better than a 100 per cent increase over net before federal taxes of 68 cents per share in the first quarter of 1936.

Glazed Paper to be Sold

[FROM OUR REGULAR CORRESPONDENT]

WEST SPRINGFIELD, Mass., May 31, 1937—A foreclosure sale of the property of the Springfield Glazed Paper Company, located near the Connecticut River, at 1 to 5 New Bridge Street, West Springfield, will take place on June 1 at 2 p. m. Louis Schulman of New York city holds a first mortgage on the plant which he is foreclosing.

The mortgage has a face value of $75,000. It was bought by Mr. Schulman for $25,000 in connection with a plan of reorganization under the amended national bankruptcy act. The company petitioned for reorganization in November, 1935, and the petition was granted in February, 1936. Under the reorganization plan, the stockholders lost their entire interest

in the company. The mortgagee is said to be the owner of varied paper interests.

The foreclosure auction will take place on the premises. The sale notice stimpulates $1000, earnest money.

Newfoundland I. P. Makes Report

The International Power and Paper Company of Newfoundland, Ltd., and Subsidiary Company, has issued the following report of its Consolidated balance sheet as of December 31, 1936:

ASSETS

Fixed Assets:		
Hydro-electric development	$14,799,554.83	
Paper mill buildings and equipment	15,871,907.56	
Land, water power rights and timber lands	6,875,922.24	
Townsite	2,719,335.24	
Steamships	968,478.30	$41,235,198.17
Woods Improvements and Equipment		199,581.91
Investments		10,000.00
Current Assets:		
Cash	$84,937.58	
Accounts receivable (less reserve)	107,550.42	
Notes receivable and open accounts receivable from International Paper Sales Company, Inc., for sales of newsprint to them (less reserve)	2,062,083.06	
Inventories and advances for woods operations	3,021,231.00	5,275,802.06
Deferred Assets and Expenses:		
Notes receivable not currently due	$239,861.53	
Prepaid insurance	22,097.15	
Deferred charges to operations	46,637.09	
Depletion on wood	203,155.13	
Discount on bonds	429,930.62	
Bond issue expense	111,663.07	1,053,344.59
Sinking Funds in Hands of Trustees		222,099.22
		$47,996,025.95

LIABILITIES

Funded Debt:		
First Mortgage 5% Gold Bonds, series of 1928 due 1968	$4,866,000.00	
First Mortgage 4½% Gold Bonds, series of 1936 due 1968	1,492,000.00	
£1,874,200 3% Guaranteed "A" Mortgage Debenture Stock due 1973	9,089,870.00	
£154,300 Second "A" Mortgage Debenture Stock due 1973	748,355.00	
£1,866,600 5½% "B" Mortgage Debenture Stock due 1970	9,053,010.00	$25,249,235.00
Current Liabilities:		
Bank loan secured	$150,000.00	
Accounts payable	578,199.10	
Accrued interest	366,913.45	1,095,112.55
Due International Paper Company and Affiliated Companies		981,736.96
Reserves:		
Depreciation on plants and equipment	$3,969,516.22	
Depletion on timber lands	1,180,652.75	
Other	743,059.97	5,893,228.94
Capital and Surplus:		
Authorized: 5,080,000 shares of £1 each		
Issued: 2,080,000 5% Preference Shares (cumulative after 1932), par value £1	$10,088,000.00	
500,000 Common Shares, par value £1	2,425,000.00	
	$12,513,000.00	
Earned surplus	2,263,712.50	14,776,712.50
		$47,996,025.95

The following is the Consolidated statement of profits and loss and surplus for the year ending December 31, 1936:

Net Sales		$7,702,406.22
Less:—Cost of sales and expenses, including charge for excess tonnage, and after deducting miscellaneous income		6,231,557.40
		$1,470,848.82
Add: Net profit on exchange		34,082.10
		$1,504,930.92
Less: Interest on First Mortgage Bonds	$295,455.60	
Debenture and other interest	871,909.94	
Depreciation and depletion	686,214.83	
Bond Discount and expense	15,530.00	1,869,110.37
Balance Deducted From Surplus		$364,179.45
Surplus Beginning		2,627,891.95
Surplus End		$2,263,712.50

More Paper Awards Announced

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 1, 1937—The Joint Congressional Committee on Printing today made 26 awards on bids received May 17 for paper for the Government Printing Office for the six months period beginning July 1 next. Most of the awards were made on May 24 as reported in THE PAPER TRADE JOURNAL AGE and the remaining awards made today were as follows:

No. 4, Champion Paper & Fibre Company, 6.51 cents.

No. 5, Perkins-Goodwin Company, 6.51 cents.

No. 6, Barton Duer & Koch Paper Company, 6.14 cents.

No. 7, Stanford Paper Company, 6.14 cents.

No. 8, Stanford Paper Company, 6.14 cents.

No. 9, Champion Paper and Fibre Company, 6.14 cents.

No. 11, Champion Paper and Fibre Company, 6.22 cents.

No. 12, Paper Corporation of U. S., 5.92 cents.

No. 16, Dobler & Mudge, 6.54 cents.

No. 17, John F. Post, Inc., 6.16 cents.

No. 27, Stanford Paper Company, 6.47 cents.

No. 28, R. P. Andrews Paper Company, 6.47 cents.

No. 29, Stanford Paper Company, 6.11 cents.

No. 30, Perkins-Goodwin Company, 6.11 cents.

No. 34, R. P. Andrews Paper Company, 6.64 cents.

No. 128, Graham Paper Company, 23.80 cents.

No. 129, Graham Paper Company, 23.80 cents.

No. 176, Graham Paper Company, 22.92 cents.

No. 177, Graham Paper Company, 22.92 cents.

No. 178, Graham Paper Company, 22.92 cents.

No. 179, Graham Paper Company, 22.92 cents.

No. 201, R. P. Andrews Paper Company, 7.60 cents.

No. 202, R. P. Andrews Paper Company, 8.30 cents.

No. 276, Barton, Duer & Koch Paper Company, 7.00 cents.

No. 277, Barton, Duer & Koch Paper Company, 7.75 cents.

No. 325, Whitaker Paper Company, 5.40 cents.

Iroquois Paper Gains Charter

ALBANY, N. Y., May 31, 1937—Thomas R. Remsen, Henry S. Howard and Hazel W. Bigelow of Hudson Falls are the principal shareholders of the Iroquois Paper Company, Inc., of New York City, a new corporation issued a charter of incorporation by Secretary of State Edward J. Flynn. The company plans to deal in newsprint paper, printing machinery and supplies. Its capitalization consists of ten shares of stock of no stated par valuation. The directors of the concern are John D. Coffin, Robert O. Sternberger and Raymond P. McCauley, of New York City. The certificate of incorporation was filed by James Gibson, Jr., Hudson Falls.

Container Corp. Lists Additional Shares

The Governing Committee of the New York Stock Exchange adopted last week the recommendations of the committee on stock lists to list 130,708 additional shares of capital stock ($20 par value) of the Container Corporation of America.

A New Era for Chemistry in the South's Wood Pulp Industry

By Harold R. Murdock[1]

The following article which was recently presented at the meeting of the American Chemical Society, Chapel Hill, N. C., and was given considerable newspaper publicity through the Associated Press is particularly opportune in view of the fact that the Technical Association of The Pulp and Paper Industry will hold its fall convention at Savannah, Ga., on October 18-20, 1937, at which time the industry will have its first real opportunity to see at first hand and discuss the various factors underlying this tremendous new development of the Southern pulp and paper industry which means so much to the industry and everyone enployed therein.

The real possibilities of the wood pulp industry in the Southern States will unfold more clearly in the third stage of its development. In this third stage, which is now beginning, the chemist will play an important part. The first, pioneering, chapter of the industry is now closed. The second, a general realization of the possibilities of the Southern pine, will end when the new mills, now projected or under construction, have begun production. In the new era, farmer, industrialist, governmental laboratories, and chemist will work together to develop strong white pulps, far superior to the present pulps from the Southern pine or hardwoods, and make them available to the rayon industry and to new industries demanding superior wood pulps. Chemistry will carry further its work of recovering by-products from the more than one-half of the wood which does not become pulp, and may eventually make these by-products of equal importance with the pulp itself.

Early Pulp Mill History of the South

The first stage of the South's wood pulp industry began over thirty years ago. Adventurous and able leaders with faith in the resources of this region erected pulp mills to grind the Southern pine to groundwood for cheap wrapping papers, and other mills were established to make the pine into unbleached kraft pulps for strong wrapping papers and bag stocks. North Carolina was in the foreground of this early development. About thirty-five years ago a groundwood mill, now the plant of Halifax Paper Corporation, was operating at Roanoke Rapids. In 1907 this mill installed a unit to substitute unbleached kraft pulp made from the Southern pine for the sulphite pulp it was purchasing from more distant sources for its paper machine operation. At Canton, N. C., in the same year, a pulp mill was erected to obtain tanning extract from chestnut wood and pulp, the extracted wood to produce bleached chestnut soda pulp. Its product was probably the first bleached pulp made entirely from Southern woods. This company also erected a mill to produce bleached sulphite from spruce and hemlock growing in the Southern Appalachians. This company, now the Champion Paper and Fibre Company, also produced bleached kraft pulp from Southern pine more than twenty years ago and is now the largest, diversified wood pulp plant in the South. Making North Carolina a pioneer state in the Southern wood pulp industry was the work of the industrialist, using known processes. The chemist assisted but was mostly concerned with the control of the operation rather than fundamental developments.

Relation of Imports to Projected New Tonnage

The second stage, general realization of the possibilities of the Southern pine, is ending with the putting into service of the more than ten new pulp mills proposed for the South within the last year. It has involved no new process. The so-called kraft process, to which pine particularly lends itself, has been used in nearly a dozen mills located in the South for many years. The chemist helped prepare the way for this second stage by his development of improved pulping and bleaching methods which made the Southern pine pulp development more attractive. The chief reason, however, for the influx of new pulp mills into the South is a desire to make the paper mills of the United States independent of imported kraft pulps, with a consequent saving to the mills on the cost of such pulps. The building of these units is based on a hope that the South has an ample supply of cheap pine wood. The new mills will have little pulp for sale on the open market. It will be converted to paper by these same companies either in the South or in their Northern plants.

In 1936 the United States imported 635,722 tons of unbleached sulphate pulp, known also as kraft. The announced tonnage of the new mills totals over 720,000 tons per year of this unbleached sulphate pulp. In other words, these new Southern mills will more than absorb the imported tonnage and allow for ample expansion in the demand for this type of pulp. The picture for bleached sulphate pulps is the same. In 1936 this country imported 102,375 tons of bleached sulphate. The new mills being erected in the South for the specific purpose of making bleached sulphate pulp will have a yearly production of 150,000 tons, an increase of nearly 50 per cent over the 1936 importation figures. The United States, therefore, will soon be self sustaining in respects to these so-called kraft pulps. In what direction, then, can the industry in the South further expand?

The Future Status of the Southern Industry

To answer this question is the challenge of the third stage of Southern wood pulp development. The intrepid newcomer to this section must heed the warning signals. The resinous nature of Southern pine renders it especially adaptable to the sulphate process with its alkaline liquor. To process this wood by the sulphite process, which depends on an acid liquor, is a far more complicated matter. Yet further

[1] Member TAPPI, Research Director, Pulp Divisions, The Champion Paper & Fibre Co.

expansion for the South depends on the ability of pine to compete with sulphite pulps, of which 786,720 tons of unbleached and 512,168 tons of bleached were imported into the United States in 1936. Whether Southern pine can meet this competition is open to question; it is up to the chemical research worker to prove that it can. Surely there is justification for the hope that he will do so. The rayon industry is a Southern institution and consumes over 150,000 tons of sulphite pulp of a high quality, purchased outside the South. Other processes for Southern pine pulping may come from the laboratories to attract this market. If the sulphate process is to be used, improved pulping and bleaching methods must be made available. We may look forward to new outlets for wood pulp. The chemist will have to be the chief source of the ideas which shall realize them. It requires little imagination to see that further expansion in the South is possible, but the new era demands a close study of possible markets rather than the mere replacement of importations. It will be brought into being by the resourceful organizations.

Nevertheless, the future involves other vital considerations than just problems of processing and sales. The future of the pulp and paper industry in the South depends upon a sustained wood supply. The second stage of the industry's development has absorbed the preferred stands of available wood. Future mills must consider the question of reforestation, which, in spite of the general belief in an unlimited quantity of available wood, is even now facing an expansion program. There is distinct danger of over-development in the South unless the wood supply is more carefully considered. Cooperation of the Government in educating the Southern farmer as well as the mills in methods of reforestation and the integration of crops with the growing of pine seedlings is imperative if the South is to build a sound foundation for progress.

To Stop Misrepresenting Hammermill

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 2, 1937—Arrow Press, Inc., of Minneapolis, Minn. has signed a stipulation with the Federal Trade Commission in which it agrees to stop representing that it furnishes Hammermill Bond paper in orders for printed stationery at the same price as it supplies its cheaper grade known as Arrow Bond paper, and will cease making unmodified claims of earnings for prospective salespersons in excess of the average earnings achieved by its salespersons who follow the respondent company's sales plan under normal business conditions.

Fan Cooled Squirrel Cage Motors

A publication describing the new line of Type CS Squirrel-Cage motors has recently been announced by the Westinghouse Electric and Manufacturing Company. These motors employ a new heat exchanger principle of cooling, self-cleaning ball bearings, tested insulation with taped end turns and corrosion resisting construction for general use indoor or outdoor where foreign matter would be harmful to the windings. Copies of the publication are available from the nearest district office or direct from Department 5-N, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 2, 1937—The Government Printing Office has received the following bids for 1,056 pounds (6,600 sheets) of ivory laid antique book paper: Whitaker Paper Company, 10.77 cents; Stanford Paper Company, 15 cents; Walker, Goulard, Plehn Company, 10.3 and 9.3 cents less 2 per cent; Virginia Paper Company, 10.5 cents; and Barton, Duer & Koch Paper Company, 16.25 cents.

The Printing Office has announced the following paper awards:

Barton, Duer & Koch Paper Company will furnish 140,000 pounds of wood bristol board in 20 inch rolls at 4.9 cents per pound, bids for which were received on May 19.

L. Hyman & Sons will furnish 7,000 sheets of 22 x 28 ash gray railroad board at $29.99 per M sheets, bids for which were received on May 17.

The R. P. Andrews Paper Company will furnish 430 sheets of 21 x 32 red gummed paper at $16.50, bids for which were received on May 14.

Barton, Duer & Koch Paper Company will furnish 108,000 pounds (315,000 sheets) of 50 per cent rag white ledger paper at 11.47 cents per pound and Reese & Reese, Inc., will furnish 8,000 pounds (40,000 sheets) of 22½ x 28½ jute tag board at 8.5 cents per pound. Bids for these items were received on May 12.

Dobler & Mudge will furnish 5,000 sheets of 22 x 28 red railroad board at $30.35 per M sheets, bids for which were received on May 10.

Gardner Richardson Install Rewinder

Among the many installations recently made by the Cameron Machine Company is that of the 134 inch trim 138 inch actual drum face left hand drive Type 18 Rewinder for the board machine of the Gardner Richardson Company at Lockland, Ohio. This is a two drum and riding roller machine. The equipment winds rolls to 60 inches in diameter and will cut widths down to 3½ inches.

The machine is equipped with a Horton variable speed drive and may be run at speeds up to 1,200 r.p.m.

Other features of this machine are an automatic system of counterweights making possible the winding of rolls of uniform density from core to circumference, and a patented system of drum grooving providing easy separation of rewound rolls.

Propose Wage Advance at Holyoke

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., June 1, 1937—The conference between the union delegations of paper mill employees and Adam Wilkinson representing the American Writing Paper Corporation and several independent mills on Friday night led to no agreement although Mr. Wilkinson said after the meeting that the two sides were gradually approaching. Following the meeting Mr. Wilkinson gave out the following proposal submitted to the union representatives, the principal point being the granting of an advance of eight cents an hour to men employees and six cents an hour to women employees. Those engaged on piece work are to get a 10 per cent advance.

The Influence of Air on Drying*

By A. E. Montgomery[1]

In any drying arrangement where the supply of heat is from a single source, as for example the drying of a material in an atmosphere of water vapor only, or drying entirely with air, analysis is fairly simple and the factors influencing rate or economy of drying may be evaluated readily. In the drying of paper entirely by air, as in the loft drying of tub sized papers, or the drying of coated paper, gummed paper, and the like, fairly simple laws may be applied and calculations made to determine the influence of changed air temperature, air velocity, and air humidity.

On the paper machine, however, and particularly on the drier section having drier felts, any attempt at exact analysis is most difficult. A brief consideration of what actually takes place in drying on the drier section with drier felts will be helpful in understanding the influence of air.

Everyone is aware that drying on the paper machine takes place below the boiling point. The temperature of evaporation varies from the wet end to the dry end of the machine, becoming progressively higher until at the dry end it is at or above 212 degrees. It also varies from machine to machine depending upon several conditions. Perhaps an average figure for temperature of evaporation of 180 to 190 deg. F. is not far off. Obviously the only way evaporation can be effected at atmospheric pressure below 212 deg. F. is by the presence of air, lowering the vapor pressure. The amount of this depression has a bearing on the steam pressure which must be maintained for a given production, or conversely the production and hence the investment cost for a given steam pressure. It follows that the influence of air is inseparable in the drying process.

Manner of Water Removal from the Paper Web

As the sheet of wet paper passes through the drier section it is pressed closely onto each drier for an interval, with the metal surface on one side and the drier felt on the other. During this interval the temperature must rise, the sole source of heat being from the steam within the drier. Then for a short interval the sheet is exposed on both sides to an atmosphere of water vapor and air. This alternate heating and exposure is repeated for each drier. It seems impossible to determine by calculation or mathematical analysis what proportion of the water removed from the paper on a machine having drying felts is absorbed into the belts, but it is certain that a very considerable proportion of the water is removed from the sheet while confined between the felt and the drier surface, and hence goes into the felt either in the form of water vapor or by capillary absorption of unevaporated water. Capillary absorption accounts for the greatest part of this, for not until the so-called free water is removed, leaving from about 18 to 25 per cent water in the sheet, or only about 10 per cent of the total evaporated, the sheet then appearing dry on the surface, does the sheet attain a temperature where water vapor would be driven into or through the dried felt. The water is absorbed into the felt at the same time the felt is receiving heat from the drier. Some of the water travels through the felt and is evaporated into the air on the outside. Another portion is evaporated into air on the paper side between driers thereby dropping the temperature of the felt as it passes around the felt roll. A third portion builds up the moisture content of the felt and must be dried out at some other point.

In whichever one of the various ways the water may leave the paper, air exerts an influence. Bearing this in mind consider very briefly the specific manner in which air acts in the evaporation process on the paper machine.

Factors Determining Effectiveness of Air

The effectiveness of air in removing water from a wet sheet below the boiling temperature is directly proportional to the difference between the vapor pressure corresponding to the sheet temperature and the partial pressure of the water in the air. The differential may be increased in any one of three ways; namely, increasing the temperature of the wet sheet, increasing the temperature of the air, lowering the humidity of the air. Since we are concerned with the condition of the air-water mixture in contact with the sheet and since this condition inevitably is different from that in the air at a greater distance from the sheet, we have a fourth factor which becomes very important, the velocity of air or impingement of air tending to determine the condition in actual contact with the sheet itself. Sherwood *(1)* reports that in the drying of wet pulp on a heated surface with air passing in parallel flow with the surface of the pulp the rate of drying varies approximately as the 0.6 power of the velocity, or, in other words, that doubling the air velocity increased the drying rate about 50 per cent.

The paper machine unfortunately provides neither for an effective or uniform influence of air. All of the drying on a paper machine having top and bottom drier felts takes place in pockets open only at the ends, which is to say the sides of the machine. The air-water vapor mixture inside these pockets is roughly 20 per cent lighter than the machine room air outside the pockets and hence tries to rise and get out, but can do so only as it is replaced by room air. Obviously the humidity and velocity factors are most favorable near the edge of the sheet and least effective at the center of the sheet where the air is relatively stagnant. This same condition applies to the action of air in drying the felt the same as the removal of water from the wet sheet.

At a certain stage in the drying of the paper sheet a critical water content is reached, as explained by Sherwood (*1*) and McCready (*2*), where the surface is no longer wet. After that period is reached air has a greatly decreased or negligible effect on the drying rate of the paper itself, but this is not to prove that air may be disregarded. Remember the felt also traveling along from the wet end to the dry end with the paper. It has a large moisture hold-

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* Presented at the meeting of the Lake States Section of the Technical Association of the Pulp and Paper Industry, Appleton, Wis., Feb. 9, 1937.

[1] Member TAPPI, Western Manager, J. O. Ross Engineering Corporation, Chicago, Ill.

ing capacity and tends to greater wetness in the center. It may even be that under certain conditions at this stage the paper absorbs water from the felt. Even after the paper has passed the critical moisture content the air may still exert a considerable influence by drying the felt. All this ties in with actual observation. We know that drying paper quite dry evens the moisture content across the width, and that an attempt to carry a high moisture content emphasizes the inherent tendency towards a wet center. We know from experience with air systems that air supplied on the last driers of a paper machine has less effect on drying rate but appears beneficial in securing even drying.

The Influence of Air on Evenness of Drying

The foregoing discussion has been based upon natural ventilation with no artificial method of controlling the flow of air. Any change in the air flow will make a change in the rate of drying and hence a change for better or worse in the evenness of drying. The familiar cross ventilation hood, now generally considered obsolete, caused a more rapid drying on the front of machine than on the back, which in some instances was highly objectionable. The most even drying can be secured only by equalizing the influence of air across the width of the sheet and the drier felt. Only some artificial, controlled air flow for ventilating the pockets and equalizing the conditions therein can accomplish this proposition.

The Influence of Air on Drying Rate

Since it has been shown that air velocity has a considerable effect upon drying rate of the wet paper, methods of utilizing this fact have long been used to increase the drying capacity of existing machines. On machines with drier felts increases in drying capacity of 10 per cent or more have been made by proper application of air in the drier pockets above. On cylinder machines without drier felts a high degree of air impingement across the width of the sheet has been found highly desirable. This is the method employed by the common, so-called, vapor absorption system. An increase in drying capacity of 15 per cent or more is frequent with this arrangement. On fourdrinier machines with drier felts space does not allow for such an arrangement and furthermore with the higher speed of such machines it is doubtful that air impingement is as necessary as on the slower speed cylinder machines. The best that seems possible is to equalize the air condition throughout the pocket.

Considerable data is available on the effect of temperature with such air supply systems. With Vapor Absorption Systems in some instances air has been available from boiler house pre-heaters at 300 to 400 deg. F. It may seem strange at first thought that this high temperature should give but very little, if any, more drying capacity than the use of air at say 175 deg. F., yet such is the fact. Wertheimer (*3*) reports experiments with air scavenging on a Yankee machine drier using temperatures as high as 450 degrees with no appreciably higher drying rate than with air at 190 degrees.

The Influence of Air on Steam Economy

The fact that an air system allows for the same production from a given machine with lower steam pressure does not in itself indicate either better or poorer steam economy. Consider, for example, the Grewin system, where the amount of steam used for heating the air is so small as to be negligible. The steam pressure required for the same amount of drying is less with the Grewin system. What happens is that the temperature of evaporation is lowered as is also the steam temperature within the driers. If the two are lowered exactly the same amount the temperature differential creating heat flow from the steam to the paper is the same, with the result that the same amount of heat would flow. This being true, the only difference in steam requirement which the Grewin system would make would be that there would be less radiation from the heads of the driers into the room. With air systems where much larger volumes of air are heated with a considerable portion of the total heat supplied into the air, the total steam economy may or may not be improved. In this latter case analysis is much more difficult because factors of ventilation and the necessity for heated air to carry away the water vapor introduces complications. It is not within the scope of this paper to discuss the steam economy of general ventilation arrangements for which the primary purpose is other than to achieve more rapid or uniform drying.

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Czechoslovakia Makes More Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 26, 1937—Production of paper in Czechoslovakia showed an unexpected increase in the final quarter of 1936. The output of the mills belonging to the paper cartel reached the highest point attained in the past seven years. The joint production of mills belonging to the paper cartel is reported at 199,740 metric tons as against 178,380 metric tons in 1935. The output of the mills adhering to the cartel does not represent the entire domestic production of paper. However, not including the production of five formerly independent mills, which joined the cartel in 1935 but were not registered as regular members, the joint output of the members of the cartel represents 87 per cent of total production. The total production of Czechoslovakia industry, therefore, has been estimated at close to 230,000 metric tons, as compared with 205,000 metric tons for 1935.

Petter Larsen Dead

Friends of Petter Larsen of Oslo, Norway, will be sorry to learn of his death at that place on May 26 after a brief illness. He was in his 80th year.

Some years ago Mr. Larsen was associated with several paper mills in the United States and had a wide acquaintance in the paper manufacturing field. Upon his return to Norway he became a member of the firm of Lorentzen & Wettre, importers and exporters of paper mill machinery and supplies. He was a member of that firm at the time of his death.

He is survived by a son and daughter residing at Albany, New York, and by two sisters residing at Oslo.

Good Paper Demand In Indiana

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., May 31, 1937—Spring finally seems to have arrived in Indianapolis and with the change of seasons comes a big increase in demand for summer specialties. For one thing, the close proximity of the Speedway races has caused a lot of retail buying here in Indianapolis since it is usual for most who go to the races to take their picnic lunches along with them. Sales of plates, cups, knives, forks, spoons and napkins all have had a good call during the past week and jobbers are finding their stocks somewhat depleted. The retail trade did not go into the season with balanced stocks by any means and this means that they will be more or less in the market from now on until the end of the season.

Tissues also have been moving nicely during the week. Jobbers report a good demand also for coarse paper and bags. The container industry is looking up, the creameries and ice cream manufacturers again coming into the market.

Most of the ice cream containers here are bought by the manufacturers, who want their displays on the outside. In turn they are sold to retailers, generally at cost.

The building industry is taking large quantities of all sorts of roofing and building paper. The season promises to be much better than that of a year ago. Already permits far exceed those of last year and retailers are building up their stock in preparation for a good summer. With the labor situation in many industrial plants somewhat eased, there has been an increase in the call for paper boxes. This is particularly true of the textile and automobile accessory industry. Even yet, the situation could be improved.

Books, ledgers and bonds are moving fairly well. Newsprint also is having a good sale with prices very firm.

Paper stock executives say the mill demand is slightly improved and prices are better than they were. All grades of paper and rags seem to be moving.

Last week officials of the Fort Wayne Corrugated Paper Company filed a certificate with the Indiana secretary of state showing the redemption of its preferred stock.

Oliver Vacuum Filtration

Oliver United Filters, Inc., has just published a new illustrated bulletin on "Vacuum Filtration and Thickening."

There are two general methods of accomplishing filtration: (1) by creating a vacuum; (2) by applying pressure.

The first method is generally continuous; the second, nearly always intermittent. Each method has its place in filtration practice and each should be considered carefully when studying the application of filtration or of clarification to any problem of separating liquids from solids.

All things considered, however, continuous vacuum filtration is to be preferred whenever it is applicable. This statement can be made without prejudice because the Oliver United line of filters includes several different types of pressure filters as well as vacuum filters.

C. C. Van Stry in England

Once again C. C. Van Stry of the Cameron Machine Company, 61 Poplar street, Brooklyn, N. Y., is visiting England.

This time it is to supervise the erection of three new mill type winders at the Arpley, Warrington, Lancashire plant of Thames Board Mills, Ltd. Two of the machines are 116 inches wide winders with 60 inch rewind capacity. The third machine is a 72 inch rewinder, also with 60 inch rewind capacity.

C. C. VAN STRY

Upon completion of this installation, there will be a total of seven Cameron Winders installed in the mills of this important firm. One of the seven is a Type 19, 176 inches wide, operating in connection with the largest cylinder board machine in the world.

Before returning to the United States, Mr. Van Stry will also call upon other customers of his company in England.

New Morris Machine Bulletin

A new bulletin on double-suction horizontally-split centrifugal pumps describes a design which has developed remarkably high efficiencies over wide ranges of capacities for each size. The bulletin concisely outlines the features of impellers and casings which have improved the hydraulic efficiencies; and the steady and thrust bearings, stuffing boxes, machining and finishing processes which have improved the mechanical efficiencies of this type of unit. Copies of the publication may be obtained by addressing Morris Machine Works, Baldswinville, New York, and asking for Bulletin 164.

Breaker Beaters for Corner Brook

The Canadian International Paper Company has recently contracted with the Dilts Machine Works, Inc. of Fulton, N. Y. for two breaker beaters for its mill at Corner Brook and it is believed that these breakers are the largest ever constructed. They are being built with cast iron tubs 20 feet 8 inches wide by 70 feet 6 inches long and the rolls are special Dilts bandless braced bar type 7 feet in diameter by 7 feet face. Delivery of these beaters is expected to be completed early in June.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, of Pulp and Paper Mills

Kimberly-Clark Improvements

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 31, 1937—Additional plant expansion and improvements of considerable proportions were announced last week by F. J. Sensenbrenner, president of the Kimberly-Clark Corporation, Neenah, Wis. He estimates the total expenditures during 1937 and 1938 at $3,500,000 to $4,000,000, to take care of an increasing demand for the company's wide range of products and specialties.

Major items now authorized are:

A new two-story machine room of concrete, brick and steel construction, 89 by 103 feet in size at the Lakeview mill at Neenah, Wis., to house two additional paper machines. This will make a total of four new machines added at this mill within the last year and a half.

A five-story building adjacent to the Lakeview mill, 86 by 254 feet in size, and of brick, concrete and steel construction, to provide for extension of warehouse and manufacturing space.

A new pulp bleaching plant at the mill at Niagara, Wis.

Installation of new boilers at both the Niagara Falls, N. Y., and Kimberly, Wis., mills.

Numerous minor improvements and modernization of equipment also are being made in various mills.

Construction was completed April 1 on a five-story warehouse 283 by 143 feet in size at the Niagara Falls, N. Y., mill, also of concrete, brick and steel construction.

Announcement also was made by Mr. Sensenbrenner that the company has contracted to sell privately an issue of $10,000,000 fifteen-year sinking fund bonds. Proceeds of the issue will be used to redeem on July 1st next $5,318,000 of bonds presently outstanding, to reimburse the treasury for expenditures for additions to property already made and to be made during 1937 and 1938, and to provide additional working capital.

The Lakeview mill has benefitted to the largest extent by the expansion program. Two five-story additions have already been completed, and two of the paper machines referred to above as being installed recently are already in operation. Construction is already in progress on the machine room and warehouse.

New Consolidated Machine

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 31, 1937—The new number 5 machine which the Consolidated Water Power and Paper Company will install at its main mill at Wisconsin Rapids, Wis., will be built to trim 120 inches, and will produce 70 tons a day. It will be equipped with the company's coating or filming process, as will the No. 3 machine at Biron, Wis., which is being rebuilt so the new coated brands can take the place of newsprint production. Success of the company's coating process has produced sufficient new business to warrant the new installations, company officials declare.

Two houses are being moved to make way for the addition to the sulphite mill. Materials are being ordered for these enlargements, and for the new finishing room addition, and the extension of the machine room and bleach plant. Two or three additional beaters also will be installed to supply the No. 5 machine.

The $1,500,000 improvement program will be pushed to completion as rapidly as possible in order to take care of increasing tonnage requirements. A crew of 200 men therefore will be at work when building operations are in full sway, under the direction of Consolidated engineers.

Ward Paper Co. to Operate

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 31, 1937—Operations will be started about June 15 by the new Ward Paper Company at Merrill, Wis., according to announcement of J. M. Ward, president.

Efforts for the last several months since purchase of the former Grandfather Falls Paper Company have been concentrated on the rebuilding and modernizing of the present paper machine, and everything in the plant behind it. New beating and bleaching equipment (two stage) of the most modern type have been installed. Chests are entirely tile lined, and all of the piping is of the latest acid resisting type, with no iron pipe whatever being used.

While there have been reports that a second machine was to be installed, Mr. Ward says there is nothing definite on these plans, and no action will be taken on expansion until the mill is in production satisfactorily with the present equipment. No announcement has been issued by the company as to the lines it intends to manufacture.

General Construction News

Baltimore, Md.—The Eastern Box Company, East Brooklyn, Baltimore, manufacturer of corrugated paper boxes and containers, fiber shipping containers, etc., has plans for new one-story addition to

plant, reported to cost close to $40,000 including equipment. Bids have been asked on general contract and work on superstructure will begin soon. Kubitz & Koenig, Emerson Tower Building, Baltimore, are engineers.

Pasadena, Tex.—The Champion Paper and Fibre Company, Houston Division, has plans under way for new unit at recently completed pulp mill on the Houston ship channel, where company has tract of about 160 acres of land. It will comprise extensions to number of present buildings and new structures, estimated to cost close to $1,500,000, with equipment. Present mill, completed a few months ago, represents an investment of about $4,000,000. Plans are also under advisement for the construction of a paper mill unit on adjoining site, and it is proposed to begin work on this part of project in near future. Main offices of company are at Hamilton, Ohio.

Brooklyn, N. Y.—The Martin Paper Box Corporation, Brooklyn, recently organized with capital of $20,000, plans operation of local plant for manufacture of paper boxes and containers. New company is represented by the Continental Lawyers Albany Service, 305 Broadway, New York, N. Y.

Winchester, Va.—Under Constructions News in the issue of PAPER TRADE JOURNAL, May 20, 1937, it was stated that "Negotiations are reported under way for the acquisition of the former local mill of the Shenandoah Paper Board Company, Inc., now held by the Eddy Paper Corporation." J. W. Kieckhefer, president of the Eddy Paper Corporation, in a letter dated May 29, states that the company wishes to deny this statement.

Hartford City, Ind.—The Hartford City Paper Company will begin superstructure soon for new power house at mill, recently referred to in these columns, and is awarding additional contracts for equipment installation, including award for boiler unit and coal pulverizing equipment to the Riley Stoker Company; coal conveyor installation to Stevens-Adamson Company; boiler-feed pumps to Goulds Pump Company; and water-softening equipment to the Cochrane Corporation.

Chicago, Ill.—The Randolph Paper and Bag Company, 810 West Randolph street, commercial paper products, paper bags and containers, has leased the four-story building at 163-65 North May street, totaling about 30,000 square feet of floor space, and will occupy at early date for new local storage and distributing plant.

Corning, N. Y.—The Corning Fibre Box Company, Hammel street, manufacturer of corrugated fiber boxes and containers, has begun superstructure for new one-story addition to plant, recently referred to in these columns, and will push unit to early completion. It is estimated to cost over $50,000, including equipment. The H. K. Ferguson Company, Hanna Building, Cleveland, Ohio, is general contractor. A. N. Tietzel, 86 East Market street, Corning, is architect.

Chicago, Ill.—The Illinois Paper Box Company, lately organized with capital of 3,000 shares of stock, no par value, has leased a floor in the building at 3704 West North avenue, totaling about 16,700 square feet of floor space, and will equip at once for new plant for manufacture of paper boxes and containers. Equipment and facilities for extensive capacity will be arranged. Incorporators of new company include H. C. Crofts and F. P. Wagner.

Newark, N. J.—The Essex Paper Box Manufacturing Company, 67 Goble street, manufacturer of paper boxes and containers, through its president, John Liambiase, has preliminary plans under way for erection of a new plant on site on Avenue C, acquired by Mr. Liambaise, formerly occupied by a part of the tannery of the Reilly Leather Company. It is expected to begin work on project in near future. The new building will be arranged both for the Essex company and the W-B Paper Box Company, 146 Summit street, manufacturer of similar paper and cardboard containers, another interest of Mr. Liambaise. The two concerns will continue to operate independently at new location. Estimated cost of new plant unit has not been announced. Frank Regnault is general manager of the W-B company.

Chicago, Ill.—The Dura-Flex Company, 939 West 35th street, maufacturer of stencils and allied paper duplicating specialties, has leased a floor in building at 525 West Seventy-sixth street, approximating 6,000 square feet of floor space, and will occupy for plant. Present factory will be removed to new location and capacity increased.

Jacksonville, Fla.—The National Container Corporation, Review and Borden avenues, Long Island City, New York, N. Y., manufacturer of corrugated paper boxes and containers, has consummated arrangements for its proposed new kraft pulp and paper mill at Jacksonville, where company recently acquired former property of the American Agricultural Chemical Company, Talleyrand avenue, as previously noted in these columns. Work is being placed under way on remodeling of several structures now on site, to be followed with the erection of a group of new units. Plant will be equipped for an initial capacity of about 200 tons of kraft paper per day, and will represent a total investment of $3,260,000. It is scheduled to be ready for service early in 1938. Company has arranged financing to carry out the project. Merritt-Chapman & Scott Corporation, 17 Battery place, New York, is general contractor. Company is also arranging for extensive timbering operations for pulp wood supply for mill and will establish several large saw mills in neighboring districts for this purpose. Close to 500 men will be employed in this latter branch of production. Samuel Kipnis is president of company. Johnson & Wierk, Inc., New York, are consulting engineers.

New Incorporations

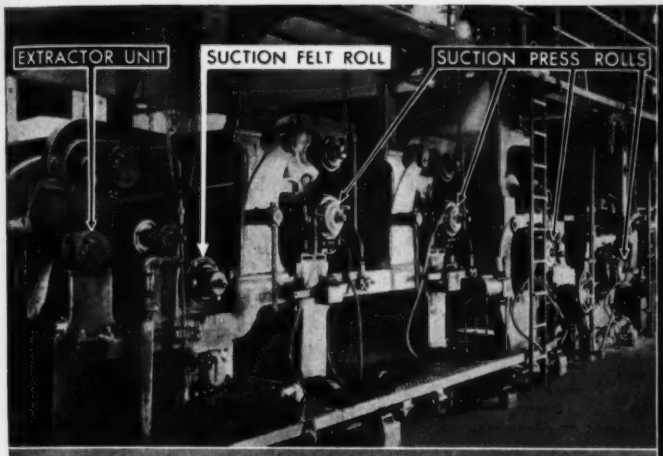
New York, N. Y.—The Iroquois Paper Company, Inc., has been incorporated with capital of 10 shares of stock, to deal in paper products of various kinds. New company is represented by James Gibson, Hudson Falls, N. Y.

Moonachie, N. J.—The Strong Cellulose Products Corporation has been chartered with capital of 100 shares of stock, no par value, to manufacture cellulose specialties. New company is represented by Walter Green, Moonachine.

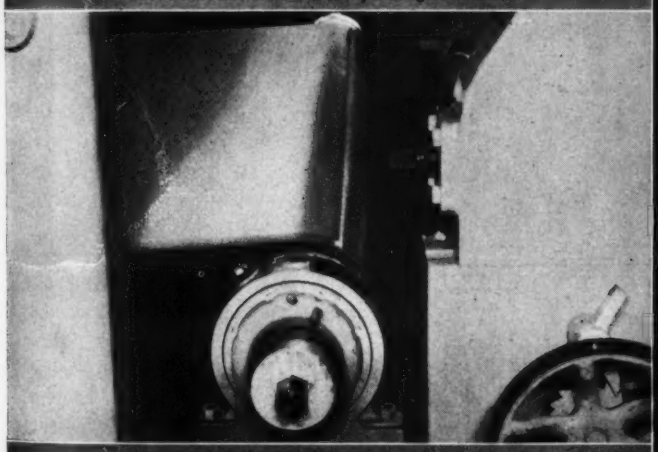
Los Angeles, Cal.—The Southern California Paper Company has been incorporated with capital of $25,000, to manufacture and deal in paper products of various kinds. The incorporators include E. Freeman Hall and A. A. Couturier, Los Angeles. New company is represented by Paul C. Jones, 607 South Hill street, Los Angeles, attorney.

New York, N. Y.—The Overseas Fibers Corporation has been chartered with capital of 200 shares of stock, no par value, to deal in fiber products.

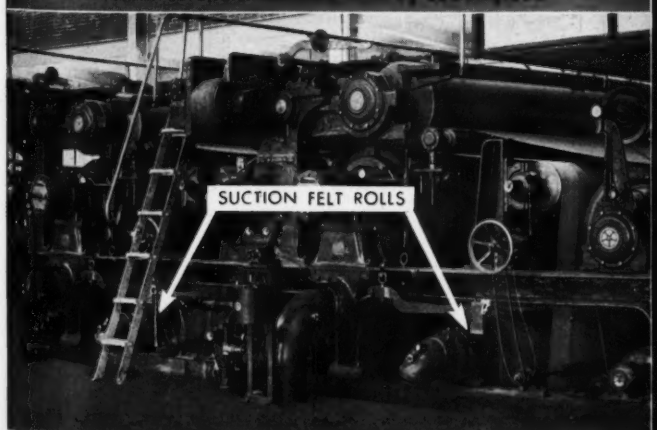
DOWNINGTOWN



Downingtown Suction Felt Roll on Bottom Felt of Board Machine with Duo-Dehydrating Press Part



Downingtown Suction Felt Roll on Press Felt of a Yankee Tissue Fourdrinier Machine Built by Downingtown



Downingtown Suction Felt Rolls on First and Second Press Felts of 236" Kraft Paper Fourdrinier

BOARD TISSUE KRAFT

Versatility of SUCTION FELT ROLLS

These pictures showing Downingtown Patented Suction Felt Rolls on three types of machines, of great difference in width, speed and product, should dispel any thought that your conditions would be the exception to the rule. Scores of installations show 20% to 100% increase in felt life due to the continuous, thorough, safe, uniform cleaning action, straight across the felt . . . Send for a copy of our new Bulletin No. 118, and learn why an astounding number of mills have changed over to modern felt cleaning in the past few years. The Downingtown Mfg. Co., Downingtown, Pa.

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OLDEST MANUFACTURER OF MODERN SUCTION ROLLS

PAPER TRADE JOURNAL

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COMING EVENTS IN THE PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY—Fall Convention, DeSoto Hotel, Savannah, Ga., Oct. 18-20, 1937.

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION, Technical Association of the Pulp and Paper Industry—Fourth Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park-American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Meeting, Springfield, Mass., June 23-25.

AUTUMN OUTLOOK IMPROVED

The industries have well filled order books and production in most lines is holding at peak levels past the time when a seasonal tapering off is usually expected, the National City Bank of New York finds in its current survey of business conditions. The bank, however, says that the slackening of new business in the industries which appeared in April has carried over into May. But it says that there is no reason to find any mystery in the reaction in the market and this slackening of new buying.

Business tends normally to swing forward and backward, and each swing is a reaction from the conditions preceding. In the last quarter of 1936 and the first quarter of 1937 there was a very rapid rise, both in prices and business activity, all over the world. Business men were buying ahead, speculators were helping the movement along, and the inducement to cover forward requirements was great enough for a time to outweigh all other considerations. The result was a temporary congestion, most acute in the markets where speculators were most active.

In the last two months this congestion has been relieved by the increase in production, and by speculators turning sellers. The reaction in the markets was inevitable and wholesome. It has been most pronounced in London, and in the commodities entering international trade, which were centers of speculation. The drop in our staple commodity prices was part of the world decline, and our security markets were affected also, both because the abnormally large foreign investments in American securities made them sensitive to disturbance abroad, and because rising industrial costs, labor difficulties, questions as to government policy and other conditions were creating uncertainty here.

With the speculative advances corrected, the outlook for the Autumn is improved. It is fair to say that commodity prices in the main are neither too high nor too low; they give reasonable returns to producers, and do not over-burden consumers. A good working balance in prices promotes trade. Conversely, continuation of the rapid advances, and over-extension of the boom psychology, would have menaced Fall business.

The forward buying which put up the markets during the first quarter left the industries with heavy backlogs of unfilled orders, against which they are now working. The slackening in new business is explained by these backlogs, for when the industries are sold far ahead buyers obviously are well covered. Of course no one can yet foretell what the situation will be when manufacturers begin to need more business. If buyers have not over-estimated their requirements they will be back in the markets in good time. However, a rapid and prolonged forward movement in trade and prices is admittedly more likely to induce over-buying and accumulation of inventories than the contrary, and this is the uncertain factor.

RUSSIA A FUTURE COMPETITOR

In an article on the newsprint situation, *Canada's Weekly*, published in London, Eng., indicates that in the reasonably near future Russia may become a factor in the world market.

"During the last two years, Russia has placed substantial orders for newsprint machinery with German firms and some plants are already working," says the paper, "whilst others are nearing completion. It would appear that the total Soviet paper requirements for 1937 are estimated at approximately 950,000 tons. Whilst it is impossible to say how much of this is actually printing quality, it is evident that the vast mass of newspapers, text books and literature of all kinds that is being produced in numerous dialects as well as in standard Russian will absorb the available supply. Nevertheless, the Soviet Government is keenly alive to the possibilities of building up an export trade in the newsprint market, and in view of the present world position, strenuous efforts are being made to extend productive capacity. At the same time, it is not anticipated that Russian newsprint will become an appreciable factor in the industry for at least two years, but that the moderate quantity which might be available in two years will be greatly increased between two and five years."

Canadian I. P. To Increase Wages

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 1, 1937—John H. Hinman, general manager of Canadian International Paper Company, has announced that, effective September 1, wages of all hourly-paid employees of his company will be increased by 5 per cent.

This increase, which will affect about 5,000 employees at the company's plants at Gatineau, Three Rivers, Temiskaming, P. Q., Dalhousie, N. B., Hawkesbury, Ont., and Corner Brook, Nfld., will involve an additional $400,000 to $500,000 in annual payrolls, he stated. The company had entered into an agreement with the employees to raise wages by 5 per cent. effective January 1, 1938, but had decided to do earlier.

This is the second wage increase announced by this company this year, a 2 cents per hour boost, equivalent to about 4 per cent, having been put into effect on May 1. The combined increases, Mr. Hinman estimates, should involve an extra $750,000 in annual payrolls. On the new basis, he explained, the minimum wage to be paid the company's workers will be $20.64 per week of 48 hours. At present, the minimum wage for the 48-hour week is $19.20. All the company's mills are operating at practically full capacity.

British Paper Industry Active

Unusual activity has been recorded in the British paper trade during recent weeks, production has been well maintained, and larger output is expected during the coming months, according to Assistant American Commercial Attache James Somerville, London, in a report to the Department of Commerce.

Activity in the markets for the raw materials of paper has been reflected in higher prices through the first quarter of the year and according to trade reports the indications are for still further increases in prices. This increase naturally has been carried on into the price of manufactured products.

Declines have been recorded in quantity and value of the imports during the first three months of the current year. Imports of newsprint, printing paper, writings, kraft and other wrappings were valued at £1,795,000 (approximately $8,975,000) compared with £2,039,807 ($10,199,035), in the corresponding three months of 1936.

Domestic production on the other hand has been well maintained or expanded during the three-month period, and exports were valued at £1,114,498 ($5,572,490), an increase of 7 per cent compared with the corresponding period of 1936, according to the report.

Reciprocal Agreements and Labor

The National Association of Manufacturers has published statistics estimating the extent to which the reciprocal trade agreements have affected labor. The number of man hours required to produce the paper and paper products imported in 1936 in excess of the imports for 1935 is given as 21,809,000, while that required to produce the excess of exports in 1936 over 1935 was 3,500,000 hours. This is a net loss for American labor in 1936 of 18,289,000 hours, equivalent to the loss of a year's work for over 9,000 men.

Production Ratio Report

The following statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

Months	1937	1936	1935	1934
January	90.3%(c)	76.1%	65.8%	.....
February	90.1%(c)	77.9%	70.0%	.....
March	90.3%(c)	76.0%	70.5%	.....
April	92.1%(c)	82.3%	70.0%	.....
May	.....	81.6%	69.4%	.....
June	.....	80.7%	72.3%	.....
July	.....	77.3%	64.9%	.....
August	.....	81.5%	70.9%	.....
September	.....	80.5%	71.9%	58.2%
October	.....	82.6%	73.6%	64.7%
November	.....	88.0%	75.3%	61.7%
December	.....	85.9%	71.2%	59.6%
Year Average	.....	81.3%	70.5%	.....
Year to Date First 20 weeks	90.5%(c)	78.6%	69.0%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1937		CORRESPONDING WEEKS, 1936	
*May 8	89.7%(c)	May 9	81.4%
*May 15	89.9%(c)	May 16	81.9%
*May 22	89.7%(c)	May 23	83.1%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: May 8, 1937	May 15, 1937	May 22, 1937
0% to 50%	35	47	32
51% to 100%	281	256	193
Total Mills Reporting	316	303	225

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported on January 4, 1937 Machine Improvement Survey.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours," were as follows:

Mos.	1937	1936	1935	1934	Mos.	1937	1936	1935	1934
Jan.	80%(e)	61%	61%	....	July	....	69%	59%	....
Feb.	86%(e)	67%	67%	....	Aug.	....	75%	65%	....
Mar.	87%(e)	68%	67%	....	Sept.	....	76%	69%	62%
Apr.	....	70%	61%	....	Oct.	....	82%	76%	63%
May	....	68%	61%	....	Nov.	....	79%	70%	56%
June	....	68%	65%	....	Dec.	....	74%	60%	52%

Week end. April 10, 1937—87%
Week end. April 17, 1937—88%
Week end. April 24, 1937—89%
Week end. May 1, 1937—87%
Week end. May 8, 1937—87%
Week end. May 15, 1937—83%
Week end. May 22, 1937—86%

(e) Basic figures revised to include new members of the National Paperboard Association.

Newsprint Exports Show Gain

MONTREAL, Que., May 31, 1937—A striking gain in the exports of newsprint for April over those of the corresponding month of 1936 is shown by figures just released by the Department of Trade and Commerce. The exports totalled 5,055,809 cwt., valued at $9,217,217, as compared with 3,857,876 cwt., valued at $6,653,093 in April, 1936. Of the total the exports to the United States amounted to $8,017,566. There was a proportionate increase in the exports of sulphite pulp, which amounted to 271,986 cwt., valued at $546,973, as compared with 144,950 cwt., valued at $233,768 in April, 1936. Other forms of wood pulp brought the total for pulp up to 1,211,357 cwt., valued at $2,817,801, compared with 884,379 cwt., valued at $1,959,367 in April, 1936.

Beckett Paper Co. Moves

The Beckett Paper Company, formerly at 300 Madison Avenue, has removed its New York Office to 350 Madison Avenue.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Continuous Causticizing System At Crossett Paper Mills*

By F. J. Lammers[1]

Abstract

The continuous causticizing system at Crossett is remarkably compact. Infilco causticizing equipment and a vertical Nichols-Herreshoff lime calcining furnace made possible a saving of approximately 40 per cent in plan area, bringing the various units into convenient, centralized arrangement for simple operation and minimum conveyor and piping runs.

The causticizing and lime recovery rooms occupy a total space of approximately 40 x 145 feet, including space for future increases in slaking and causticizing equipment capacity. The system provides for 170 tons per 24 hours present capacity with a minimum of 10 per cent reserve capacity for peak periods, on the basis of 150 cu. ft. of green liquor and 100 cu. ft. of white liquor per ton of pulp.

Continuous settling of green liquor, green liquor lime slaking and causticizing, white liquor clarification, green liquor dregs washing and lime sludge washing, dewatering and reburning and lime handling equipment are provided. Multiple tray clarifiers of new rectangular design provide new facility for settling and sludge collection with greatly reduced space requirements; simplicity and accessibility of system is also due to direct through flow of liquor; space and maintenance in lime reburning are reduced by use of Nichols calcining furnace.

Several new developments in continuous causticizing equipment have been incorporated in the southern and southeastern kraft mill expansion of the last year. The benefits and economies of continuous causticizing have been sufficiently demonstrated to assure their inclusion in practically all plans for such mills, but no general and authoritative digest of the various methods and equipment developed for this purpose appears to be available. Such a summary is included as part of the immediate work before the Equipment Committee of TAPPI; pending its appearance, a brief description of the newest continuous system now in operation at the Crossett Paper Mills, Crossett, Ark., may be of interest.

As is always the case in chemical engineering operations, the preference for continuous over batch or intermittent operation may be credited to the greatly increased uniformity of process work and the reduction in man-power required. True enough, an individual batch operation may be carried out with extreme care to yield optimum results, but batch processing is strictly repetitive; it is subject to unpredictable human element in every process step — whereas a continuous system may be brought to assured high efficiency through convenient, occasional adjustment. Automatic control does away with the chore of repeatedly starting from scratch, maintaining previously established operating ratios without human element except in occasional readjustment or emergency.

The chemistry involved in causticizing and lime recovery is not complex, but the relative success attending this stage of the chemical recovery of cooking liquor is a critical factor in determining the total production cost of pulp. The requirements of the mechanical equipment involved are therefore a major item in the selection of heavy equipment. With the exception of evaporation, practically all the unit chemical engineering processes are utilized in caustic room operation, which briefly comprises four major steps; slaking of the lime; causticizing of the green liquor; separation and washing of the precipitated calcium carbonate; and reburning of this sludge to quicklime.

Main Features of Crossett Installation

With the exception of sludge washing, the Crossett installation embodies unusual features in all of these phases. Greatly reduced space, interconnecting piping, and insulation requirements are made possible by new settling equipment, and at the same time all operating conditions are brought under more convenient and more absolute control of the operator. Briefly, these comprise automatic, single point control of liquor-flow through the entire system; pulverizing and return of slaker rejects and cores to the raw green liquor, whereby any available lime is utilized in preliminary causticizing, and the weight of the rejects is utilized in accelerating the settling of green liquor dregs; the use of practically all green liquor in slaking; and the provision of considerably increased slaking time.

Cooking Liquor

The system provides cooking liquor for 170 tons of pulp per day rated capacity with a minimum of 10 per cent reserve capacity for peak periods, on the basis of 150 cubic feet of green liquor and 100 cubic feet of white liquor per ton of pulp.

Green liquor, from the dissolving tanks beneath the recovery furnaces, is received by the causticizing department in a 12 foot diameter by 10 foot high agitated green liquor surge tank, equipped with a constant rate,

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 22-25, 1937.

[1] International Filter Co., Chicago, Ill.

adjustable swing pipe outlet. The flow rate through the entire caustic room is determined at this point and subsequent green liquor and caustic liquor flows are automatically maintained in accordance with it. This surge tank also receives the pulverized slaker rejects, diluted to a pumpable slurry with a small amount of green liquor; the agitation provided disperses them uniformly throughout the green liquor.

From the surge tank, raw green liquor is settled free of slime and dregs in a rectangular Infilco super-settler, 16 feet wide by 18 feet long by 12½ feet liquid depth. Approximately 1730 square feet of settling area (10.3 square feet per ton of pulp per 24 hours) are provided in a total of fourteen settling compartments. As will be described in more detail, the rectangular construction of this type of settler offers unique advantages in maintenance of absolutely uniform settling flows, permanent separation of settled sludge from influent liquor, and reduction of liquid volume in detention by more than 50 per cent with improved settling. Collection of sludge is carried out on a new principle (at right angles to fluid flow) by variable-speed scraping mechanism, completely removable from the settler without draining or stoppage of operation.

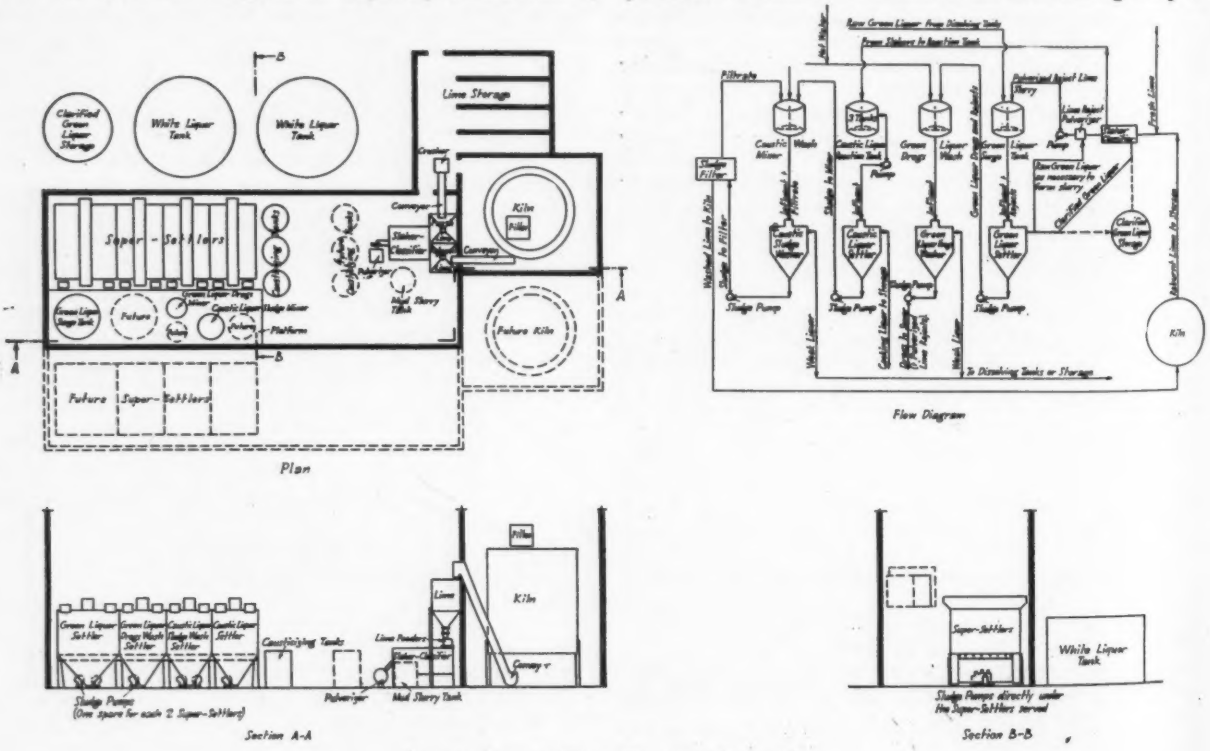
Practically all the clarified green liquor is used in slaking the causticizing lime. Fresh lime from a multiple carload storage building is passed through a jaw crusher for reduction to less than 2 inches size, and carried by a bucket elevator to a 7 foot square by 8 foot high fresh lime bin. Reburnt lime from the kiln is conveyed to an adjoining hopper of exactly similar construction, each feeding into a type M Infilco lump line feeder mounted on the slaker. Each feeder handles lime in any size from ⅛ inch up to 2 inch lumps; both feeders discharge into the inlet end of the slaker, one feeder handling reburnt lime and the other fresh lime. Both feeders are equipped with recorders indicating the total delivery of each feeder, and the feeders are adjustable over a range from 100 per cent to less than 25 per cent of maximum capacity. Each is equipped with a ¼ h. p. motor.

The Slaker

The influent flow of green liquor is measured by a rate of flow indicator, and then enters the slaking compartment, the first section of the 8 ft. wide by 16 ft. long slaker, where it is agitated with the quick lime. This agitator runs the length of the slaker, and is the one principal moving part in the unit. Radial agitator arms, attached to a central lengthwise shaft, pick up lumps of lime from the half round bottom of the slaker, agitating them and keeping them in intimate suspension throughout the green liquor. The mixture gradually progresses through the slaker over a retention period from 30 to 38 minutes to the outlet end; by this time all available lime has been slaked and reduced into an intimate slurry of lime and green liquor, with the causticizing reaction well under way.

The rejects, siliceous or overburnt lime particles, and any grit or stones that reach the outlet end of the slaker are picked up in grit cups, and dropped wet into a 36-inch diameter by 42-inch long ball mill and reduced to 100 mesh or finer, the resulting reject slurry being pumped to the green liquor surge tank for utilization of any available lime and improvement in settling rate of the green liquor. This is realized through the weighing down of the green liquor slime, into which rejects are dispersed by the agitation in the green liquor surge tank. Should there be any unslacked lime exposed by the pulverizing process in any of the cores, it is utilized in reaction with the green liquor, rather than wasted. The rejects are settled and washed with the green liquor dregs and discharged to the sewer; their presence invites greater compacting and decreased moisture content in the settled dregs, lowering soda losses at this point.

The bottom of the slaker is equipped with a steam jacket for maintenance of maximum causticizing tempera-



INFILCO CAUSTIC ROOM CROSSETT PAPER MILLS.

ture, or in the event of starting up from an inoperative, cold condition. A water operated ejector in the slaking compartment removes all lime dust, vapor and moisture above the liquid, this water going to the sewer or to some washing application or other point of use. The slaker is protected against possible flooding by an automatic valve on the inlet green liquor line, which trips closed with a failure of water pressure or in the event of a maximum high level in the slaker being reached; in this event, a trip switch also shuts off the lime feeders as well as the green liquor flow, and contacts are provided to ring an emergency alarm.

The simplicity of the single unit slaker and classifier installation, the assurance of complete mixture of lime and green liquor, the long reaction time, and the utilization of rejects mark a significant advancement in causticizing procedure. The long slaking time of approximately one-half hour assures maximum conversion of all available lime before any particles are rejected. Coupled with the pulverizing and return of the rejects proper, there is certainty that all lime fed into the system will be used without loss, and maximum economy of chemical.

Causticizing Tanks

The slaker is followed by three continuous causticizing tanks, each 7 feet in diameter by 8½ feet high, equipped with individually removable agitators which do not require draining of the tanks for inspection or removal. The causticizing tanks are placed in series to prevent short circuiting, and provide an additional three-quarter to one hour reaction time for development of maximum causticity. The last tank is provided with an automatic flow control valve at the suction connection to a special Bingham sulphate liquor centrifugal pump, controlling the causticized liquor discharge in automatic proportion to the initial green liquor flow.

The slurry of causticized liquor and precipitated calcium carbonate is pumped to the white liquor settler, which is similar in construction to the green liquor settler, except that it is only 12 feet in width. All settlers are of rectangular shape with adjoining walls, eliminating six insulation surfaces. A total settling area of approximately 1500 square feet is provided in this unit, equivalent to 9 square feet per ton of pulp per 24 hours. Like the green liquor super-settler, the white liquor settler is provided with variable-speed, easily removable scraping mechanism. The thickened sludge is washed, and the clear white liquor is sent to two 26-foot diameter by 19-foot high white liquor storage tanks.

Washing and Settling

The green liquor dregs and the caustic lime sludge are individually washed in Infilco supermix wash tanks, 5 feet in diameter by 7 feet high and 7 feet diameter by 8½ feet high respectively, and the wash slurries then flow by gravity to individual wash super-settlers, each of the same size and construction as the white liquor settler, which they adjoin. The weak white liquor and dregs wash liquor from these clarifiers flow to weak liquor storage, the dregs to waste, and the washed sludge to a 6-foot diameter slurry tank from which it is pumped to a rotary vacuum filter by Filtration Engineers, Inc.

The wash water flow to both the green liquor dregs wash and the calcium carbonate sludge wash is measured in each case by a venturi-type rate of flow indicator conveniently located so that the operator may easily read and totalize the wash flows, for convenient adjustment in relation to the total green liquor inflow. Thus influent green liquor and effluent weak liquor wash are capable of ready equalization in the causticizing department, and the entire system thus kept in closer equilibrium.

The compactness of the room is made possible by the rectangular construction of the four settlers, and some consideration of these units is pertinent. Each settler receives influent liquid in the center of a lengthwise, central, vertical feedwell which acts as a distributing chamber feeding the tray compartments that lie on each side of it. The liquor enters each tray compartment through a long, narrow slot at the bottom of each compartment, running horizontally the length of the feedwell.

Liquid thus entering each tray compartment, in a thin flat band or strip, flows uniformly, slowly and continuously across the tray compartment and upward to the effluent collector pipes at outside walls of the settler. Settled, clear liquor is drawn off uniformly the length of each tray by these collector pipes, and each pipe discharges its individual quantity of clarified liquor through an adjustable weir into a common effluent flume which is equipped with a clear liquor outlet connection.

In flowing across and upwards through the tray compartments, which requires approximately two hours, the settleable solids are left behind and collect upon the surface of the tray. It is periodically scraped away at right angles to fluid flow by scraper arms which operate along the bottom of each tray through the entry slots in the feedwell. The scrapers deliver the collected sludge into a sludge well at each end of the settler, from whence the sludge falls and thickens during its descent into the sludge sump below. The sludge scrapers are automatically reciprocated back and forth the length of the trays by a self-reversing, simple chain drive located above the liquid level at the top of the feedwell. The scraper assembly rides on tracks above the liquid, and has no bearing surfaces or guides beneath the liquid level to wear or cause difficulty.

A variable speed motor permits selection of any one of four scraper speeds, and adjustment of the effluent weirs permits individual flow control through each settling compartment. Because flow occurs over a uniform rectangular area and into a collector pipe provided with uniform take-off orifices, settling flow is under definite and absolute control at all times, without possibility of variation. The low position of the scrapers in the tray; the fact that sludge is removed over a constant area so that scrapers do not flood; and the slow operating speed of the scrapers prevents agitation or significant eddy currents that would disturb settling. The entire scraper assembly is conveniently removable by turning it into the feedwell and lifting it completely out of the unit, without the necessity of stopping operation.

Advantages of the System

These unique features of construction lead to the following advantages:

(1) Absolute control and uniformity of settling flow, with consequent greater efficiency in obtaining clear liquor.
(2) Removal of sludge at right angles to settling flow, so that sludge is neither carried with nor against the flow; this means minimum disturbance in settling, and permits shallower trays and consequent greater settling area from unit settling volume.
(3) Uniform sludge handling areas over the entire tray surface, so that sludge is not crowded into the settling space above or into influent liquor entering the tray, either of which would disturb settling.
(4) Thicker, more condensed sludge due to separate provision of sludge wells and sumps which handle sludge only and not a mixture of sludge and influent liquor; thickening is furthermore improved by the utilization of full vertical distance of approximately 10 feet for compacting of sludge before discharge.

In addition to producing new efficiencies in settling and sludge handling, the rectangular construction of the settler permits remarkable utilization of space and advantageous arrangement of associated units. Insulation and heat losses are saved by placing adjoining units together with common partition walls, and foundation requirements are greatly simplified and decreased in cost.

External bracing of the settler is unnecessary, since the interior trays form strong girders that brace the rectangular sidewalls; the end walls are braced and stayed by the feedwell partition walls running the length of the unit, and by additional ties across the sludge wells at each end. The flat top is easily and completely insulated, and permits the top tray to operate under completely submerged conditions for full settling efficiency. The space beneath the settler is open for access to the sludge pumps, which are conveniently installed in this space using short, direct pump suction connections—a matter of great importance in handling thick sludges of this type.

Each sludge pump is located directly under the settler it serves. These are Marlow duplex piston pumps with adjustable stroke, delivering the sludge under pressure to the next point of application. Extremely short (6-foot) and perfectly straight suction connections connect to the sludge hoppers, and the absence of diaphragms minimizes attention and replacement. Four service and two standby sludge pumps are provided, and all are interconnected and located in conveniently accessible arrangement on the floor.

The Calciuming Furnace

The calcium carbonate sludge from the wash settler is given a final wash on the rotary filter and the partially dried filter cake drops by gravity directly onto the top drying hearth of a vertical Nichols-Herreshoff lime calcining furnace. This kiln is an interesting departure from the usual horizontal rotary lime kiln, because of the large saving in space, increased accessibility, and opportunity for greater control of drying and calcination with reduced refractory maintenance. The furnace is 38 feet overall height by 22 feet in diameter, having eight superposed horizontal hearths, the lime being raked from one hearth downwardly to another, countercurrent to the gas flow. There are eight hearths in all, the upper four drying and dehydrating the sludge and the lower four constituting the high temperature calcination zone.

The design of this furnace permits unusually complete utilization of heat energy, the outlet gas temperature being only 1600 to 1650 deg. F. More intimate contact between lime and gas flows is obtained through positive rabbling of the lime in shallow, well-distributed layers with flow reversal on leaving and entering each hearth. The rabble arms are individually removable from a single central shaft, through access doors outside of the furnace; arms are constructed with conveniently separable teeth, all of a special heat-resisting alloy iron. Extremely short conveyors lift reburnt lime from the kiln and fresh lime from storage into their respective bins supplying the slaker.

Wash tanks and the green liquor surge tank are located on an elevated platform, which also serves the control weirs of the settlers. From this platform, 16 feet wide by 54 feet long, all operations of both present and future expansion requirements will be controlled, with the exception of lime feed adjustments to the slaker and control of the sludge pumps, which are carried out from the first floor. The compact, convenient arrangement of the various units and lime kiln permits unusually short conveyor and piping runs, and makes all adjustments convenient for the operator.

Including the area occupied by the Nichols-Herreshoff lime kiln, the causticizing department occupies a total space of approximately 40 by 145 feet, including room for a future 100 per cent increase in slaking and causticizing capacity. A simple, symmetrical addition to the building will provide duplicate settlers and lime kiln in a space only 24 by 100 feet.

Without crowding, the present capacity represents a saving of almost 40 per cent in ground area over former systems, while providing greater control and convenience in operation, shorter conveyor runs, and more accessible piping connections. On the basis of a future 100 per cent increased capacity, this saving will mount to over 50 per cent. Translated into dollars and cents on an approximate building cost of 15 cents per cubic foot, these advantages, reducing both first cost and maintenance of building structures, represent important fundamental economies; with such primary savings both in initial and in operating costs, it is anticipated that the Crossett causticizing installation will contribute materially to a minimum pulp production cost.

Ground Wood Paper Decisions

A series of important decisions affecting various groundwood papers is reported by Warren B. Bullock, manager of the Import Committee, in his current letter to domestic paper mills.

A petition by the importers for a rehearing of the case involving paper imported for a rotographic supplement of the *Christian Science Monitor* of Boston has been denied by the United States Court of Customs and Patent Appeals. The court has held that such paper was not standard newsprint, and in fact not even newsprint. After receiving briefs of the importers and the Government on the application for a rehearing, the court refused to reopen the case. The original decision was rendered by a majority of the court of five members, one judge not participating and another dissenting without writing a dissenting opinion.

The United States Customs Court has held that imports of colored poster paper at Los Angeles are dutiable as printing paper and not duty free as standard newsprint as claimed by the importers. Four cases are involved in this decision which establishes for the first time that papers in colors deeper than those commonly used by newspapers, are not standard newsprint, regardless of other factors. All of the paper was imported in sheets, and in practical effect the decision means that the color book of the Groundwood Paper Manufacturing Association, together with samples of poster paper as supplied Customs officials by the association and the Import Committee, will be used as criteria for the determination of the dutiability of colored paper.

Other cases involving importations of canary and mandarin paper imported at Los Angeles, classified for duty as printing paper, were abandoned in court by the importer who had claimed the paper to be duty free as standard newsprint.

Canary news from Sweden, imported in sheets in a weight basis of 31 pounds, 24 x 36 inches priced at less than $40, held dutiable as printing paper at ¼ cent per pound and 10 per cent, is claimed by a New York importer to be duty free in a protest filed in the United States Customs Court.

Correction

In the Technical Section of the PAPER TRADE JOURNAL of May 13, 1937 there appears on page 50 an article entitled "Alkali-Staining Property of Paper." This should have been designated as a tentative standard of the Technical Association of the Pulp and Paper Industry. Suggestions and corrections should be sent to the Secretary of TAPPI, 122 E. 42nd street, New York, N. Y.

Instrumentation Studies. XV

A Comparison of the Carter and the Gurley Stiffness Testers

By The Staff of The Institute of Paper Chemistry

The measurement of the stiffness of paper depends upon the application of a small force to produce bending of the paper sample. Although paper is not homogeneous in structure, nor isotropic, since properties of paper measured with and across the machine direction vary markedly, the expressions in use to describe the behavior of homogeneous and isotropic elastic bodies may be applied to paper within certain limits. It is to be recognized that these expressions cannot be expected to hold rigorously when thus applied to a material such as paper.

As shown in the report on the Gurley and Smith-Taber stiffness testers (preceding paper), the stiffness of paper is proportional to the width of the sample, and over a limited range varies inversely as the square of the length, as might be expected by analogy to the behavior of a perfectly elastic body. The measurement of an empirical value of the stiffness of paper by the Gurley tester is of such reliability that the instrument may be used for the further comparison of other stiffness testers.

As in the Smith-Taber and Gurley instruments, the Carter tester involves the application of a force to bend the paper through a constant angle, which in the latter instrument is established as 90 degrees. As shown in Fig. I, the paper sample P is clamped at A and bent through 90 degrees to pointer B by the wire T attached to the weight W. The force applied is derived from the moment exerted by the weight W raised above its position of equilibrium below O. The scale of the instrument is so divided that, as the moment arm of the weight is increased, being proportional to the sine of the angle θ, the pointer S, swinging also through the angle θ, indicates a reading proportional to the force exerted on the paper. M is a counter weight arranged so that W hangs directly below O when in the zero position. A measurement of the force required for a given angle of bending is taken as the stiffness to be determined. It is to be observed that the thrust on the paper at a bend of 90 degrees is normal to the paper, and that the arc assumed by the paper is always very nearly the same. The values of stiffness obtained by this instrument should bear a constant or nearly constant ratio to the values measured on the Smith-Taber and Gurley instruments. The data given below are an evidence that this conclusion is justified. As the paper is bent, it adapts itself to the bending force gradually so that a short interval of time must elapse before the reading may be obtained. For light papers this is not necessary. For heavier papers, as the paper assumes a position of equilibrium with the bending force after a brief interval, the reading after such an interval is taken as the stiffness desired. For very heavy papers and board this equilibrium reading is not reached, the paper continuing to sag for a long period of time. An alternative method for obtaining the stiffness for such cases is discussed below.

All of the readings require a sample of size 1.5 x 3 inches.

Scale Ranges

As in the Gurley instrument, various scale ranges may be obtained by varying the size of the weight used. Three weights in the ratio 1 to 5 to 10, used with a scale reading to 35, thus make a full scale reading of 3.5, 17.5, and 35 possible. The moment arm of the weight is not variable, as is possible in the Gurley tester. The results indicate that the maximum possible range of the Carter tester with the weights as provided, is less than that of the Gurley tester. The experimental results indicate, further, that the full scale range is not satisfactory, because of the limitations imposed by the lack of elasticity of the paper samples. The bending of the paper through an angle of 90 degrees imposes too severe a strain upon the paper sample, with consequent deformation of the paper. With this limitation in mind, measurements have been made upon papers of high stiffness, the stiffness measured acquiring significance if taken as an empirical result which can be compared with the reading of the Gurley tester.

In passing from one scale range to the next, the constancy of the multiplying factor has been assumed. That this procedure is valid is demonstrated by the lack of any discontinuity in the experimental curve between the values measured on the two instruments.

The scale reading of the Carter instrument can be obtained at any time after the paper is brought to the position of 90 degrees bend. This is more convenient than the method of reading the deflection of the Gurley tester. In the latter instrument, the reading must be taken at the instant of slip between paper and the vane applying the pressure to the paper.

Data

Samples of paper of widely varying stiffness have been measured with both instruments. A list of the papers used is included in Table I. The values of the stiffness obtained for the "with machine" and "across machine" directions are given in Tables II and III. The values given are those read directly on the scales of the instruments but corrected for the weights used. The sensitivity of the Carter tester is variable from full scale to ½ scale and to 1/10 scale by choice of the weight used.

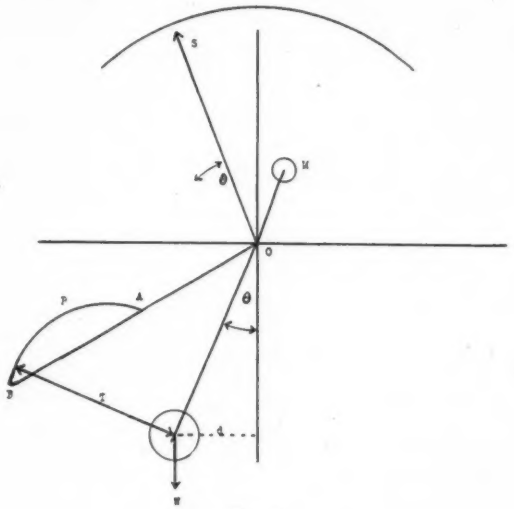


FIG. 1.
Carter Stiffness Tester

TABLE I

A	Bond ‡33	W	Drawing
B	Butcher's wrap ‡82	Y	Blotter ‡11
C	Newsprint ‡87	AB	Ledger
D	Bond	AC	Book—supercalendered
E	Glassine ‡23	AF	Cover
F	Typewriter paper—lab. stock.	AH	Cover
H	Index Board ‡98	BA	L 3815
J	Sulphite Bond	BB	M. F. Litho 70
K	L. W. Kraft Board	BC	Sulphite Bond
L	Offset 120	BD	L. W. Bristol
M	E. E. Litho 95	BF	Ledger
N	L. W. Book 80	BH	Sulphite tag
O	Offset 80	CC	E. F. Book 60
P	Bond ‡106	CF	Solid Jute ‡2 finish
R	Mimeo	CE	Folding Box Board ‡2 finish
S	Bond	CH	Bottle cap board
T	Tag stock ‡1	DD	E. F. Litho 50
U	Coated Book	EE	E. F. Book 60
V	Kraft	FF	Sulphite Bristol

The sensitivity of the Gurley tester can be varied by varying both weight and moment arm. Three weights of size 5, 25, and 50 grams are available; also three moment arms in the ratio 1:2:4. Hence, if the sensitivity using the 5 gram weight with an arm ratio of 1 is taken as unity, the other sensitivities may be obtained by using the following formula:

$$S = \frac{Wl}{5},$$

where $W = 5$, 25, or 50
and $l = 1$, 2, or 4.

In no case were two weights used simultaneously, although this could be done if desired.

It is to be noted that the values on the Gurley tester represent the *sum* of two readings taken with and against the curl of the sample. For the Carter the average of two corresponding readings has been used.

The relation between the two instruments is slightly dependent upon the grain of the paper. The data have been analyzed for both in and across directions so as to give the calibration curves, which are to be used for the direction required. The difference is slight and an average curve could be used with introduction of little error.

The data included in Tables II and III and plotted in Figs. 2 and 3 show the effect of the machine direction. The Gurley instrument indicates a higher value for the stiffness for a given Carter reading for paper cut across the machine direction than for paper cut in the machine direction.

An alternative procedure for obtaining the reading for heavy papers is to take the reading immediately upon bending the paper to 90 degrees before equilibrium is established. The results from such a series of measurements are shown in Table IV and plotted in Fig. 4. At low values, the results are the same for both methods, so that the curves would merge into each other. Points for both

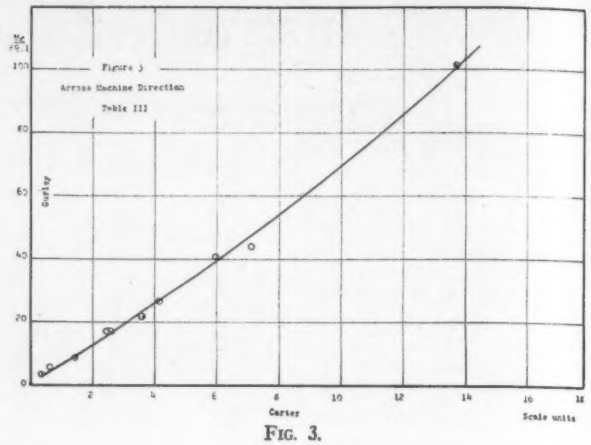


FIG. 3.

in and across directions are shown on the same curve, the result being to obtain an average calibration curve.

Reliability and Accuracy of Results

The readings taken on the Gurley tester represent the average of a series of samples cut from the sheet of paper under test. For each sample, ten readings were obtained, five taken with and five against the curl of the paper. (The

Summary of Data

TABLE II
IN DIRECTION

Paper	Gurley	Carter (Scale Units)
A	9.92	1.34
C	4.14	0.59
D	21.60	3.92
E	1.26	0.062
M	35.70	6.00
W	52.70	9.11
AC	7.25	1.04
BA	36.00	5.77
BD	53.40	8.62
BF	15.20	2.68
FF	84.20	13.30

TABLE III
ACROSS DIRECTION

Paper	Gurley	Carter (Scale Units)
B	5.71	0.611
M	18.20	2.48
W	26.60	4.14
AC	3.48	0.334
AF	101.70	13.70
AH	40.60	5.98
BH	224.80 (sag)	26.00
BA	17.10	2.44
BD	21.80	3.61
BF	8.80	1.43
FF	43.68	7.14

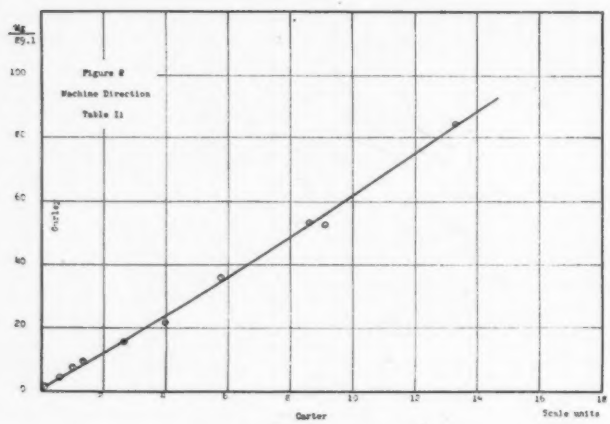


FIG. 2.

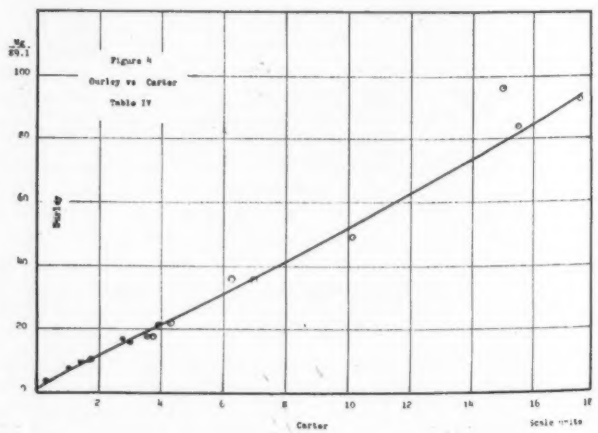


FIG. 4.

TABLE IV

Paper	In		Across	
	Gurley	Carter	Gurley	Carter
	(Scale Units)		(Scale Units)	
A	9.92	1.34	....	....
B	....	....	5.71	0.611
C	4.14	0.59	....	....
D	21.60	3.92	....	....
E	1.26	0.062	....	....
H	84.00	15.50	....	....
J	3.49	0.414	....	....
L	93.00	17.60	....	....
M	35.70	6.97	18.20	2.72
P	21.70	4.31	....	....
S	17.50	3.53	....	....
T	Too heavy to measure.			
U	10.70	1.87	....	....
V	16.90	2.75	....	....
W	49.10	10.15	26.60	4.82
AB	16.20	2.73	....	....
AC	7.25	1.04	3.48	0.33
AF	....	....	97.10	16.20
AH	96.70	15.00	40.10	6.85
BA	36.00	6.28	17.10	2.44
BB	10.45	1.73	....	....
BC	7.15	1.28	....	....
BD	52.30	10.20	22.10	4.11
BF	15.60	3.00	8.80	1.43
CC	5.79	0.89	....	....
CE, CF, CH	Too heavy to measure.			
DD	3.41	0.295	....	....
EE	9.15	1.41	....	....
FF	82.20	15.60	4.26	8.01

paper should be as free from curl as possible.) Several readings can be taken without affecting the stiffness of the sample, if proper care is taken not to bend the sample in handling. The sample was then cut to size (1.5 x 3 inches) for the Carter tester and a hole punched near the end in a position determined by a template. The bending weight is attached to the paper by a wire hooked through this hole.

As the paper is drawn into the bent position, jerking should be avoided to prevent undue strain upon the paper. Upon completion of the reading, the paper must be removed and reversed so as to eliminate the effect of the curl of the sample. For papers of high stiffness, an interval of time was necessary before the paper could be brought to equilibrium at an angle of bend of 90 degrees. As the paper adjusts itself to the pressure applied, the reading shifts until a final value is obtained. Although the paper has been strained beyond its elastic limit, the procedure is justified, provided the values so obtained lie upon a smooth curve which can be used as a calibration curve for the instrument. This procedure becomes less and less satisfactory with increasing stiffness, because of the length of time necessary to insure the ultimate bending of the sample. For this reason the full scale range of the instrument is of little use.

The average mean deviations computed for ten sets of papers, usually with five samples of each paper, are shown in Table V. The size of the deviations represents fluctuation in the formation of the paper, as well as the average error in the reading of the instruments. The difference in the per cent deviations is small, indicating that the obtainable accuracy in the reading of each instrument is about the same, the difference present being slightly in the favor of the Carter tester.

TABLE V.—AVERAGE PER CENT MEAN DEVIATION

Paper	In		Across	
	Gurley	Carter	Gurley	Carter
A	15.80	6.70	....	....
B	....	....	11.40	16.20
C	4.80	4.20	....	....
D	3.70	0.87	....	....
M	7.85	5.77	2.72	2.82
W	3.71	1.21	1.44	2.66
AC	4.70	6.65	6.32	6.86
BA	6.72	0.92	3.80	8.60
BD	6.00	0.95	3.76	5.53
BF	2.69	0.86	2.16	2.38
FF	2.26	0.90	2.36	2.74
AF	....	....	4.33	5.83
AH	....	....	5.66	2.50
Av. per cent deviation	5.82	2.90	4.40	5.61

Av. over all—Gurley 5.11%
Carter 4.76%

Discussion

The reading of the Gurley instrument is highly dependent upon the nature of the edge of the paper sample and the smoothness of the surface. An apparent increase in stiffness is produced by any friction between vane and paper. The effect of the edge and surface of the sample is eliminated in the Carter, although the length and width should be accurately established. The Gurley is very sensitive to length of sample. The angle of bend being larger in the Carter tester, the force required is correspondingly larger and thus more accurately measurable. However, the disadvantage due to the deformation of the paper is objectionable. It would be instructive to build a Carter tester using an angle of bend comparable to that of the Gurley. If an accuracy in the determination of this bend comparable to that obtained by the method employed in the Gurley tester could be secured, the advantage of the static reading of the Carter would be obtained without the disadvantages of either instrument.

The zero of the Carter instrument is not as dependable as desired. Any friction in the bearings is objectionable in establishing the zero.

As the curves indicate, however, stiffness as measured by the Carter tester is closely comparable to that as measured by the Gurley. The curves are very nearly straight lines, and the experimental points fit the curves very closely. The Gurley tester is useful over a wide range of papers, but for light papers the Carter is very convenient, readings being obtained in a shorter time than with the Gurley. The weight of the paper would tend to lower the value of stiffness as measured on the Carter while increasing the value as measured by the Gurley. This is a possible explanation of the fact that the curves do not tend to pass through the origin. For papers whose stiffness is very high, the Carter Instrument is unsuited, because of the uncertainty in the force to produce 90 degree bending, this force varying with time. For such papers the Gurley tester is to be preferred. All papers were ranked in the same order by both instruments, and any departures from the curves are within the experimental error.

Summary

The Carter stiffness tester has been calibrated in terms of the Gurley tester. Both instruments measure the force applied to produce a certain bending, that of the Carter being exactly 90 degrees. The values obtained with the Carter tester are very nearly proportional to the readings of the Gurley tester, the curves obtained being very nearly straight lines. These curves may be used as calibration curves to give the Gurley reading for a given Carter reading. The curves have been obtained for both the machine and across machine directions of various papers.

The range of the Carter is less than that of the Gurley, because of breakdown of the elasticity of paper at high values of stiffness and large angles of bending.

Delaware Valley TAPPI to Meet

The last meeting of the season of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry will be held at the Bala Country Club, 50th street and Woodbine avenue, Philadelphia, on June 18, 1937 at 7:00 P. M. This will be a Dinner-Dance and tickets will be $2 per person.

Roy Underdown, American Dyewood Company, Philadelphia, Pa. will arrange for golfing privileges at $.56 per person for those who have the time and inclination.

Tickets may be obtained from Mr. Underdown or the following, Jacob Edge, Alan Boyd, C. C. Shubert.

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Paper Specialties

Method of Plasticizing Glassine Paper. Lewis Dozier, assignor to Rhinelander Paper Co. U. S. pat. 2,058,961 (Oct. 27, 1936).—Only part of the plasticizing material (containing a wetting agent to facilitate penetration into the sheet) is incorporated into the partially dried web, and the remainder of the plasticizer is incorporated at the dampener prior to supercalendering.—A.P.-C.

Gummed Paper Product. Ferdinand W. Humphner. U. S. pat. 2,058,157 (Oct. 20, 1936).—The base paper is first coated with a thin film of inexpensive adhesive such as tapioca dextrin mixed with equal parts of water, starch coatings, flour, casein, a blend of low-grade animal glue with a selection of vegetable gums, etc. A thin coating of superior adhesive (preferably animal glue) is then placed on top of the first coating and dried to a condition in which it will not adhere to the succeeding convolutions of paper when wound in a roll.—A.P.-C.

Coated Wrapping Paper. Edouard M. Kratz, assignor to Marbo Products Corp. U. S. pat. 2,058,021 (Oct. 20, 1936).—One part of a 10 per cent solution of formaldehyde in water is mixed with 22 parts of a 13 to 14 per cent casein solution containing about 3.4 per cent glycerine, and is immediately coated on paper—A.P.-C.

Apparatus for Making Corrugated Vegetable Fiber Board. William H. Mason, assignor to Masonite Corp. U. S. pats. 2,058,333 and 2,058,334 (Oct. 20, 1936).—The apparatus comprises a set of parallel spaced-apart interiorly heated (suitably by means of steam) pipes, above which is a set of similar pipes positioned respectively over the spaces between the pipes in the lower set. The moistened sheet of board is placed on the lower set of pipes. The central pipe of the upper set is depressed into contact with the neighboring ones of the lower sets; the two adjacent pipes of the upper row next depressed, and so on until all the upper pipes have been lowered. They are maintained in this position until the board has been dried, after which they are raised and the board is removed. *No. 2,058,333* covers the apparatus and *No. 2,058,334* covers the product and the method of obtaining it.—A.P.-C.

Method of Making Paper Board. Herman L. Kutter, assignor to The Black-Clawson Co. U. S. pat. 2,059,184 (Oct. 27, 1936).—The stock is supplied to the vat of the cylinder mold at consistencies very much less than the usual practice (preferably 0.07 to 0.3%), at a rate very much in excess of the rate of flow of white water through the cylinder mold, and the excess of stock is removed from the machine by means of a large capacity pump and recirculated back to the inlet side of the vat.—A.P.-C.

Coated Paper Manufacture. Frank Hadfield, assignor to The Mead Corp. U. S. pat. 2,059,343 (Nov. 3, 1936).—A coated paper adapted for printing and book paper comprises a sheet having a surface coating containing approximately 70 to 85 per cent by weight of a mineral filler including a major proportion of carbonate filler and a minor proportion of satin white, and approximately 30 to 15 per cent. by weight of a mixed stach-casein size containing approximately 90 per cent starch and 10 per cent casein.—A.P.-C.

Process and Apparatus for Manufacturing Design Roofing. Richard A. Holdsworth, assignor to The Barrett Co. U. S. Pats. 2,056,273, 2,056,274 and 2,056,275 (Oct. 6, 1936).—*No. 2,056,273*—Designs are applied to sheet roofing by forcing viscous or plastic bituminous material through a stencil by means of suitable pressure rolls. *No. 2,056,274*—Viscous coating material is positively fed through a preforated belt or stencil on to the sheet of roofing. *No. 2,056,275*—A coating material is applied to sheet roofing and a stencil is pressed against and partially embedded in the soft coating layer before the layer has had an opportunity to cool and set. Surfacing material is applied over the entire surface of the sheet and stencil and the latter is then removed.—A.P.-C.

Thick Butt Shingle. Clarence R. Eckert, assignor to The Barrett Co. U. S. pat. 2,058,578 (Oct. 27, 1936).—Roofing felt or the like is saturated with asphalt and allowed to cool. A coating of asphalt is then applied along spaced parallel strips on the web, granular surfacing material is applied and pressed into the coated strips, and the web is slit into strips along the lines of demarcation between the coated and uncoated strips and simultaneously cut transversely along stepped lines into individual shingles.—A.P.-C.

Floor Covering. Edward T. A. Coughlin, assignor to The Barber Asphalt Co. U. S. pat. 2,056,958 (Oct. 13, 1936).—A flexilizing ingredient such as raw or reclaimed synthetic rubber, latex, etc., is added to the aqueous casein paint used as a "back coat" for painted, felt, floor coverings. The paint thus obtained is suitable also for the "stop coat" applied on the top side of the felt before printing or painting the decorative designs.—A.P.-C.

Composition Roofing. Gerald R. Stark and James A. Main, assignors to The Patent and Licensing Corp. U. S. pat. 2,062,149 (Nov. 24, 1936).—A shingle or shingle strip presenting a thickness at the butt edge approximating the thickness of the butts of wood or slate shingles is produced by forming a lip or depending portion along the exposed edge of an asphalt-coated and mineral-surfaced felt, and securing in the angle between the lip and the main body of a narrow lath of a thickness corresponding substantially to the width of the lip.—A.P.-C.

Roll Roofing and Process of Making Same. Clarence R. Eckert, assignor to the Barrett Co. U. S. pat. 2,061,066 (Nov. 17, 1936).—In the manufacture of roll roofing a narrow band on stripe contiguous to the line where the granular surfaced asphalt coated base meets the uncoated and unsurfaced selvage area is provided with a seal coating of high melting-point asphalt, which may be made thinner than, or of the same thickness as, the coating of waterproofing material applied to the exposed portion. If of approximately the same thickness, it is preferably covered with tissue paper.—A.P.-C.

Laminated Panel. Herbert J. Woodall and Meredith S. Randall, assignors to Woodall Industries, Inc. U. S. pat. 2,028,962 (Jan. 28, 1936).—An improved automobile panel includes a core layer of substantial thickness of loosely integrated fibrous material which is not readily deformable and which possesses high sound and heat insulating characteristics, an inner lamination which also possesses insulating characteristics and which is readily deformable and compressible, and an outer lamination of thermoplastic material that is readily deformable under the influence of heat and pressure.—A.P.-C.

Process of Treating Cellulose and Derivatives Thereof. James K. Hunt and George H. Latham, assignors to E. I. du Pont de Nemours and Co. U. S. pat. 2,060,733 (Nov. 10, 1936).—The deteriorating effect of aging on various cellulose manufactures, including paper, is retarded by treating the material with stabilizing chemical agents having the general formula $R_1X_1C(:X_2)N(R_2)R_3$, in which X_1 and X_2 are oxygen or sulphur, R_1 is a monovalent (hydrocarbon radical, and R_2 and R_3 are hydrogen or monovalent organic (especially hydrocarbon), radicals.—A.P.-C.

Coating Composition and Its Preparation. Milton O. Schur, assignor to Brown Co. U. S. pat. 2,060,129 (Nov. 10, 1936).—Ammonia-preserved rubber latex is aerated until it is substantially completely de-ammoniated; a water-immiscible rubber solvent is emulsified with a glue solution, and is then mixed with the substantially deammoniated rubber latex. The product is particularly suitable for finishing the surface of artificial leather sheet material.—A.P.-C.

Impregnated Fibrous Material. Per K. Frolich and Peter J. Wiezevich, assignors to Standard Oil Development Co. U. S. pat. 2,061,570 (Nov. 24, 1936).—Fibrous materials are impregnated with a solution of polymerization products of such unsaturated hydocarbons as isobutylene so as to improve their resistance to water, oxidation, fungus attacks, etc. Suitable dyes, resins, fungicides, insecticides, fireproofing agents and the like, may also be dissolved and (or) suspended in the solvent.—A.P.-C.

Leather-Like Material. Henry P. Shopneck. U. S. pat. 2,060,243 (Nov. 10, 1936).—A water-laid fibrous base consisting of a felted mixture of relatively long and short fibers is impregnated with a rubber-containing compound. A portion at least of the fibers are of vegetable origin and the shorter fibers are thin and substantially individually isolated and at least a portion of the longer fiber are relatively unravelled bundles of fibers.—A.P.-C.

Composition Containing Partially Deacetylated Chitin and Suitable for Resisting Laundering. Warner J. Merrill, assignor to E. I. du Pont de Nemours and Co. U. S. pat. 2,047,218 (July 14, 1936).—Partially deacetylated chitin is used with fibrous or cellulosic materials such as paper or cellulosic derivatives. Numerous examples are given.—A.P.-C.

Water-Resistant Paper. George W. Rigby, assignor to E. I. du Pont de Nemours and Co. U. S. pat. 2,047,226 (July 14, 1936).—A coating of a 3% aqueous solution of a medium viscosity acetate of deacetylated chitin is applied to one surface each of two sheets of paper; the sheets are joined by their coated surfaces, the acetylated chitin is insolubilized by exposure to ammonia gas and the assembly is dried. Material thus made is resistant to water.—A.P.-C.

Apparatus for Making Reenforced Binding Material. David E. Skedgell, assignor to The Millville Manufacturing Co. U. S. pat, 2,059,404 (Nov. 3, 1936).—A continuous paper strip is rounded to tabular form and so maintained for a time during uniform progression in the apparatus. Adhesive is applied to its outer rounded surface, and thread is wrapped around the tubulated strip. The wrapped threads are subsequently severed where they are crossed over an interval between the contiguous edges of the tubulated strip. In the case of double thickness material another paper strip, sychronously delivered, is pressed into contact with the adhesive-coated side of the first strip upon resumption of the latter to its original flat condition.—A. P.-C.

Apparatus for Treating Sheet Material. George C. Borden, Jr., assignor to Riegel Paper Corp. U. S. pat. 2,056,939 (Oct. 13, 1936).—The invention relates to the production of an ornamented paper having a crystalline configured intaglio produced by applying a solution of nitrocellulose or other film-forming material and of a crystallizable compound in a volatile solvent and then removing the crystals by means of a suitable solvent. The apparatus consists essentially of a wash-pan (preferably divided into compartments) through which the sheet, after the coating has set and the crystals formed therein, is passed counter current to a solvent for the crystals and is subjected to progressively increasing temperature. Means are provided for removing the dissolved crystals from the solvent and returning the latter to the wash-pan—A.P.-C.

Safety Papers. Samuel Lenher, assignor to E. I. du Pont de Nemours and Co. U. S. pat. 2,061,632 (Nov. 24, 1936).—Aminoarylthiazoles, their derivatives or salts, are incorporated in the paper. These compounds are practically unaffected by to the agents that produce ageing of paper, and they produce a conspicuous and practically nonremovable stain when treated with common ink eradicators.—A.P.-C.

Manufacture of Sheeted Fiber-Binder Products. Milton O. Schur, assignor to Brown Co. U. S. pat. 2,057,166 (Oct. 13, 1936).—Sheet pulp such as high alphacellulose wood pulp is chopped into pieces and fed into a hammer mill which fluffs the pulp into a mass of fibers or fiber flocks capable of being lifted and kept in suspension in a blast of air. The air current is caused to pass through a circuitously moving wire screen on which the fibers deposit as a layer of loosely entangled fibers which, after suitable compacting, if desired, may be progressively removed from the screen and wound into a roll, or first put through an impregnating bath and then wound.—A.P.-C.

Treatment of Pineapple Fiber, etc. Oscar C. Greene, assignor to Tropical Products Corp. U. S. pat. 2,056,185 (Oct. 6, 1936).—Fiber such as those of the Bromelia family are heated with a solution containing a hexametaphosphate such as that of sodium to effect their purification and obtain a product high in alphacellulose for acid filters, etc.—A.P.-C.

Friction Pad Material. Willard J. Slagle, assignor to Dewey and Almy Chemical Co. U. S. pat. 2,048,475 (July 21, 1936).—A fibrous base has one surface coated with a rubber-containing friction material and the other surface coated with an adhesive substance such as a rubber composition capable of adhering more strongly to the base than to a smooth surface against which it is adapted to be placed.—A.P.-C.

Manufacture of Reenforced Sheet Material. Louis E. Lovett, assignor to Industrial Rayon Corp. U. S. pat. 2,058,476 (Oct. 27, 1936).—Sheet material such as transparent paper is reenforced by means of a fabric woven by conventional means disposed in the vicinity of the dope-delivering mechanism. As the reenforcing fabric is woven only as fast as the finished sheet is made, only a few woof threads are present at any time in the unset condition before being set in the material of the sheet.—A.P.-C.

Strip Material for Container Closures. Jay B. Eisen,

assignor to Ferdinand Gutmann and Co. U. S. pat. 2,050,248 (Aug. 11, 1936).—A lamina of thin paper coated with gilsonite is used together with a lamina of metal foil such as aluminum foil carrying a layer of adhesive which is montacky at ordinary temperatures, and the laminas are bonded by a stratum such as a suitable cement.—A.P.-C.

Manufacture of Impregnated Sheet Products. John C. Sherman, assignor to Brown Co. U. S. pat. 2,057,167 (Oct. 13, 1936).—A composite sheet for impregnating purposes consists of both an air-laid web and a water-laid felt in superposed relationship, the water-laid felt preferably existing as the outer ply on either or both faces of the air-laid web.—A.P.-C.

Process of Producing Pulps Containing Rubber Substances. Harry C. Fisher and George Acus, assignors to The Richardson Co. U. S. pat. 2,057,331 (Oct. 13, 1936).—A rubber-containing dispersion is mixed with moist or wet fibrous material in the presence of sufficient of the dispersion-sustaining preservative to prevent coagulation at ordinary temperature. The preservative is driven off by raising the temperature and further mixing, resulting in a relatively stable association of fibers and rubber that can be formed into paper pulp.—A.P.-C.

Manufacture of Chemically Modified Papers. George R. Richter, assignor to Brown Co. U. S. pat. 2,056,294 (Oct. 6, 1936).—Regenerated cellulose is incorporated into a paper sheet which is to undergo parchmentization, vulcanization, mercerization, or analogous chemical transformation.—A.P.-C.

Water-Resistant Indurated Fiber and Method of Making the Same. Duncalf M. Hollingworth, assignor to Continental-Diamond Fibre Co. U. S. pat. 2,059,947 (Nov. 3, 1936).—The invention provides an indurated fiber characterized by low water-absorption comprising a number of sheets of partially hydrolyzed cellulose joined together and containing a primary aromatic amine-formaldehyde resin within its pores and upon its surfaces associated with the partially hydrolyzed cellulose.—A.P.-C.

Machinery

Technical Measuring Methods for Pulp Digesters. T. Waern-Bugge. Svensk Pappers, Tidn. 39, Special No. 92, 97-98 (Sept. 7-8, 1936). The article discusses instruments and methods for measuring and recording temperature and pressure in stationary and revolving digesters—C.J.W.

The De La Roza Continuous Digester. Anon. PAPER TRADE J. 103, No. 17:18-21 (Oct. 22, 1936).—A description of the machine—A.P.-C.

Cellulose Digester. F. W. L. Schilde. U. S. pat. 2,059,149 (Oct. 27, 1936).—The essential feature of the invention consists in using exclusively steam or gas-jet devices, disposed outside the digester proper, for affecting all the feeding, evacuating and circulating required—A.P.-C.

Improvement to the Refining of Fibers and to Refiners. D. Manson Sutherland, Jr. Fr. pat. 797,985.—The stock is passed between relatively revolving refining members with parallel-moving "mated" or mutually corresponding main rubbing or abrasive surfaces, which may be flat, conical or radially curved in profile. The mating surfaces are provided with radially extending flow grooves, and are maintained at a close clearance (preferably not more than 0.05 mm.).—A.P.-C.

Hydraulic Inlet for Paper Making Machines. William R. Kellett and Harry M. Ostertag, assignors to Paper Patents Co. U. S. pat. 2,060,808 (Nov. 17, 1936).—The inlet is built in the form of an adjustable spout structure that avoids the customary high pond directly over the breast roll.—A.P.-C.

Mechanical Difficulties in the Formation of Newsprint at High Speeds. L. C. Anderson. Pulp Paper Mag. Can. 37: 633-636 (Oct., 1936).—A brief outline of some of the chief difficulties encountered in the manufacture of newsprint on wide and fast machines.—A.P.-C.

Ball and Roller Bearings in the Pulp and Paper Industry. Kakon Waern. Svensk Pappers-Tidn. 39, Special No. 101-102, 107-108, 111-112 (Sept. 7-8, 1936). The article discusses the important part which ball and roller bearings play in the construction of machinery for the pulp and paper industry.—C.J.W.

Wm. E. Hooper & Sons Co. Joins TAPPI

The Wm. E. Hooper & Sons Company of Philadelphia has become a company member of the Technical Association of the Pulp and Paper Industry. Founded in 1800 as a small sail-making company which was compelled to import the fabric it used, Wm. E. Hooper & Sons Company is as old as the cotton duck industry in the United States. Moreover, it is one of the sixty firms in the country that have been in the same family for more than a century.

Today the Hooper plant at Woodberry, Baltimore, Md., occupying several acres, is conceded to be one of the best-equipped heavy fabric mills in the country; while the brand-name "Hooperwood" is known throughout the world as a symbol of high quality in cotton duck for almost every industrial, commercial and marine purpose. The general offices of the company are located at Juniper and Cherry streets in Philadelphia and branch sales offices are maintained in principal cities.

Not only was the Hooper Company one of this country's pioneers in the production of cotton drier felts for use in paper-making, but it is one of the few companies in the United States that have contributed substantially to the development of asbestos drier felts.

As a result, the name "Hooperwood" stands today for dependability in both types of drier felts, while continued field and laboratory research keep Hooper engineers at the forefront in the further improvement of this important phase of paper-making.

Pacific TAPPI to Meet at Vancouver

The Pacific Section of the Technical Association of the Pulp and Paper Industry will meet jointly with the Pacific Division of the Superintendents Association at the Hotel Vancouver, Vancouver, B. C. June 11 and 12, 1937.

There will be a golf tournament and jamboree on Friday. On Saturday morning the following papers will be presented: "Recent Trends in Pulp Bleaching," by John D. Rue; "The Trends in Sulphite Pulping," by Andreas Christensen. In the afternoon there will be a roundtable discussion led by Carl Fahlstrom and L. S. McCurdy. In the evening at the banquet R. Bell-Irving of the Powell River Company Ltd. will be toastmaster, and A. Wells Gray, Minister of Lands, will be the speaker.

Research Paper RP979

Owing to a regrettable error, we failed to give credit to the original source of publication in reprinting in the issue of the PAPER TRADE JOURNAL of May 27, 1937, the article entitled Simplified Volumetric Determination of Alpha, Beta and Gamma Cellulose in Pulps and Papers, by Herbert F. Launer.

This article was Research Paper RP979 and was printed in the Journal of Research of the National Bureau of Standards, volume 18, March 1937.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING MAY 29, 1937
SUMMARY

Cigarette paper .....1,702 cs.
Wall paper .....24 bxs., 24 cs.
Paper hangings .....11 bls.
Newsprint .....17 bls., 19,577 rolls
Printing paper .....45 rolls, 230 cs.
Wrapping paper .....238 bls., 2,753 rolls, 48 bdls.
Filter paper .....19 pkgs., 23 cs.
Filter mass .....100 bls.
Drawing paper .....2 cs.
Metal coated paper .....69 cs.
Surface coated paper .....110 cs.
Coated paper .....2 cs.
Basic paper .....11 crates, 76 cs.
Baryta coated paper .....24 crates
Photo paper .....9 cs.
Decalcomania paper .....20 cs., 1 drum (duplex)
Decalcomanias .....22 cs.
Transfer paper .....20 cs.
Paper tubes .....170 ctns., 28 cs.
Miscellaneous paper .....306 bls., 121 rolls, 7 cs.

CIGARETTE PAPER

De Manduit Paper Corp., *Lafayette,* Havre, 2 cs.
Champagne Paper Corp., *Lafayette,* Havre, 1489 cs.
H. H. Strauss, *Paris,* Havre, 208 cs.
De Manduit Paper Corp., *Paris,* Havre, 2 cs.
Gluckman & Strauch, *Excambion,* Marseilles, 1 cs.

WALL PAPER

S. K. Lonegren, *Gripsholm,* Gothenburg, 24 bxs.
——, *Washington,* Havre, 19 cs.
——, *New York,* Bremen, 5 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *Britanic,* London, 11 bls.

NEWSPRINT

N. Y. Post, *Rigel,* Port Alfred, 1309 rolls.
International Paper Co., *New York,* Dalhousie, 4641 rolls.
International Paper Sales Co., *New York,* Dalhousie, 1223 rolls
Perkins Goodwin & Co., *Berlin,* Bremen, 287 rolls.
Jay Madden Corp., *Berlin,* Bremen, 744 rolls.
International Paper Co., *West Kyska,* Dalhousie, 4157 rolls.
International Paper Sales Co., *West Kyska,* Dalhousie, 2102 rolls
N. Y. Evening Journal, *Mineric,* Quebec, 2345 rolls.
News Syndicate Co., *International #1,* Gatineau, 306 rolls.
New York Evening Journal, *Washington,* Hamburg, 127 rolls.
Jay Madden Corp., *Washington,* Hamburg, 131 rolls, 17 bls.
H. G. Craig Co., *A.C.D.,* Gatineau, 294 rolls.
Jay Madden Corp., *Vingaren,* Kotka, 481 rolls.
Lunham & Reeve, Inc., *Vingaren,* Kotka, 481 rolls.
N. Y. Evening Journal, *Vingaren,* Kotka, 316 rolls.
Perkins Goodwin & Co., *New York,* Hamburg, 331 rolls.
Jay Madden Corp., *New York,* Bremen, 350 rolls.

PRINTING PAPER

Dingelstedt & Co., *New York,* Bremen, 45 rolls, 94 cs.
E. Dietzgen & Co., *New York,* Hamburg, 136 cs.

WRAPPING PAPER

Lincoln Import Specialties Corp., *Gripsholm,* Gothenburg, 1411 rolls.
Guaranty Trust Co., *Gripsholm,* Gothenburg, 128 bls., 1189 rolls.
——, *American Banker,* London, 18 bls.
——, *New York,* Hamburg, 92 bls., 48 bdls., 153 rolls.

FILTER PAPER

H. Reeve Angel & Co., Inc., *Queen Mary,* Southampton, 19 pkgs.
H. Reeve Angel & Co., Inc., *American Banker,* London, 11 cs.
——, *New York,* Hamburg, 12 cs.

FILTER MASS

A. W. Fenton, Co., Inc., *New York,* Bremen, 100 bls.

DRAWING PAPER

H. Reeve Angel & Co., Inc., *American Banker,* London, 2 cs.

METAL COATED PAPER

K. Pauli & Co., *Berlin,* Bremen, 35 cs.
K. Pauli & Co., *New York,* Bremen, 34 cs.

SURFACE COATED PAPER

Gevaert Co. of America, *Westernland,* Antwerp, 60 cs.
Dingelstedt & Co., *Westernland,* Antwerp, 7 cs.
C. Happel, *New York,* Hamburg, 43 cs.

COATED PAPER

W. J. Byrnes, *Queen Mary,* Southampton, 2 cs.

BASIC PAPER

Globe Shipping Co., *New York,* Bremen, 76 cs., 11 crates.

BARYTA COATED PAPER

Globe Shipping Co., *New York,* Bremen, 24 crates.

PHOTO PAPER

J. J. Gavin, *Queen Mary,* Southampton, 9 cs.

DECALCOMANIA PAPER

B. F. Brakenfeld & Co., *Scythia,* Liverpool, 20 cs., 1 drum, (duplex).

DECALCOMANIAS

Phoenix Shipping Co., *New York,* Hamburg, 19 cs.
L. A. Consmiller, *New York,* Hamburg, 3 cs.

TRANSFER PAPER

D. C. Andrews & Co., *New York,* Hamburg, 20 cs.

PAPER TUBES

——, *New York,* Bremen, 170 ctns., 28 cs.

MISCELLANEOUS PAPER

A. Giese & Son, *Lafayette,* Havre, 54 bls.
The Boregaard Co., Inc., *Gripsholm,* Gothenburg, 113 rolls.
F. L. Kramer & Co., *Gripsholm,* Gothenburg, 129 bls.
Coty Processing Co., *Paris,* Havre, 7 cs.
——, *New York,* Hamburg, 123 bls.
Keuffel & Esser Co., *New York,* Hamburg, 8 rolls.

RAGS, BAGGINGS, ETC.

Burros Bag Co., Inc., *Volendam,* Rottendam, 100 bls. bagging.
R. & V. Miller, Inc., *Volendam,* Rotterdam, 10 bls. rags.
Manufacturers Trust Co., *Britannic,* London, 13 bls. rags.
Castle & Overton, Inc., *East Indian,* Buenos Aires, 800 bls. rags.
Manufacturers Trust Co., *Scythia,* Liverpool, 39 bls. rags.
Manufacturers Trust Co., *Ilsenstein,* Antwerp, 19 bls. rags.
Banco Coml. Italiane Trust Co., *Westernland,* Antwerp, 91 bls. jute card waste.
——, *Dunstan,* Ceara, 109 bls. cotton waste.
E. J. Keller Co., Inc., *Exchange,* ——, 197 bls. rags.
R. Blank, *Vincent,* Havre, 118 bls. rags.
Castle & Overton, Inc., *Vincent,* Havre, 13 bls. rags.
Continental Bank Trust Co., *Vincent,* Havre, 38 bls. rags.
Hicks Costarino & Co., *Vincent,* Havre, 40 bls. rags, 68 bls. new cuttings.
Hicks Costarino & Co., *Vincent,* Dunkirk, 41 bls. new cuttings.
——, *American Banker,* London, 51 bls. old strings.
Royal Manfg. Co., *Skagerak,* Shanghai, 250 bls. cotton waste.
Railway Supply & Manfg. Co., *Skagerak,* Shanghai, 50 bls. cotton waste.
New England Waste Co., *Skagerak,* Shanghai, 150 bls. pickers.

National Felt Works, *Skagerak*, Shanghai, 100 bls. cotton waste.
O. Smith & Sons, Co., *Skagerak*, Shanghai, 150 bls. cotton waste.
D. S. Stern, *Skagerak*, Kobe, 50 bls. cotton waste.
———, *Skagerak, Kobe*, 300 bls. cotton waste, 59 bls. rags.
Hoffman Lion Mills, *Skagerak*, Kobe, 75 bls. rags.
Williamson Products Co., *Kano Maru*, Kobe, 150 bls. cotton waste.
New England Waste Co., *Kano Maru*, Tientsin, 150 bls. pickers.
J. T. Flannery, *Exermont*, Casablanca, 60 bls. bagging.
———, *Exermont*, Casablanca, 166 bls. bagging.
Banco Coml. Italiane Trust Co., *New York*, Hamburg, 66 bls. rags.

BONE GLUE

———, *Ida*, Trieste, 300 bags.

OLD ROPE

———, *Westernland*, Antwerp, 389 coils.
———, *American Banker*, London, 78 bls., 7 coils.

CASEIN

Balfour Guthrie & Co., *Eastern Prince*, Buenos Aires, 1751 bags.

WOOD PULP

A. Giese & Son, *Volendam*, Rotterdam, 20 bls. wood pulp.
M. Sone, *Berlin*, Bremen, 375 bls. wood pulp.
Perkins Goodwin & Co., *Gripsholm*, Gothenburg, 294 bls. sulphite.
Gottesman & Co., Inc., *Gripsholm*, Gothenburg, 900 bls. sulphate.
Bankers Trust Co., *Ida*, Trieste, 4000 bls. sulphite.
Castle & Overton, Inc., *Vingaren*, Viipuri, 1650 bls. wood pulp.
Lagerloef Trading Co., *Vingaren*, Viipuri, 2103 bls. sulphite.
Lagerloef Trading Co., *Vingaren*, Viipuri, 1284 bls. sulphate.
Lagerloef Trading Co., *Vingaren*, Kotka, 25 bls. sulphate, 170 bls. sulphite.
———, *New York*, Hamburg, 199 bls. wood pulp 30 tons.
Bulkley Dunton Pulp Co., *W. A. McKenney*, ———, 3250 bls. sulphite, 650 tons.
Bulkley Dunton Pulp Co., *W. A. McKenney*, ———, 3000 bls. sulphate, 600 tons.
Bank of The Manhattan Trust Co., *W. A. McKenney*, Hernosand, 180 bls. sulphate, 30 tons.
Price & Pierce, Ltd., *W. A. McKenney*, Hernosand, 1200 bls. unbleached sulphite, 200 tons.
Bank of N. Y. Trust Co., *W. A. McKenney*, Hernosand, 1200 bls. sulphite, 200 tons.
Chemical Bank Trust Co., *W. A. McKenney*, Hernosand, 450 bls. sulphite, 75 tons.
Brown Bros. Harriman & Co., *W. A. McKenney*, Hernosand, 5430 bls. kraft pulp, 905 tons.

WOOD PULP BOARDS

H. Fuchs & Son, *Gripsholm*, Gothenburg, 180 crates.
Salwen Paper Co., *Gripsholm*, Gothenburg, 9 bls.
———, *Vingaren*, Viipuri, 779 rolls.

NEWARK IMPORTS

WEEK ENDING MAY 29, 1937

H. G. Craig Co., *Donpaco*, Donnacona, 335 rolls newsprint.
H. G. Craig Co., *Newscarrier*, Donnacona, 333 rolls newsprint.

ALBANY IMPORTS

WEEK ENDING MAY 29, 1937

Johaneson Wales & Sparre, Inc., *Brosund*, Sundsvall, 1000 bls. chemical pulp, 200 tons.
Johaneson Wales & Sparre, Inc., *Brosund*, Sundsvall, 2980 bls. sulphite, 560 tons.
Johaneson Wales & Sparre, Inc., *Brosund*, Sundsvall, 1500 bls. sulphate, 250 tons.
Perkins Goodwin & Co., *Brosund*, Sundsvall, 4350 bls. sulphate, 725 tons.
Bulkley Dunton Pulp Co., *Brosund*, ———, 4250 bls. wood pulp, 850 tons.
———, *Brosund*, Gefle, 5500 bls. sulphite, 1117 tons.
Perkins Goodwin & Co., *Brosund*, Stugsund, 450 bls. sulphite, 90 tons.
Halifax Power & Pulp Co., *Havorn*, Sheet Harbor, 9228 bls. mech. ground wood, 2066 tons.
Lagerloef Trading Co., *Vingaren*, Helsingfors, 230 bls. sulphite.
Lagerloef Trading Co., *Vingaren*, Viipuri, 259 bls. sulphite, 156 bls. sulphate.
Lagerloef Trading Co., *Vingaren*, Kotka, 3615 bls. sulphite.

BOSTON IMPORTS

WEEK ENDING MAY 29, 1937

———, *Excambion*, Alexandria, 160 bls. rags.
E. J. Keller Co., Inc., *Excambion*, ———, 50 bls. garments.
International Purchasing Co., *Excambion*, Genoa, 165 coils old rope.
Beacon Wiper Supply Co., *Skagerak*, Kobe, 100 bls. rags.
Loumar Textile By Products Co., *Skagerak*, Kobe, 200 bls. bagging.
Bank of The Manhattan Trust Co., *Ida*, Trieste, 1008 bls. wood pulp.
Price & Pierce, Ltd., *Bockenheim*, ———, 750 bls. mechanical pulp.
Price & Pierce, Ltd., *Bockenheim*, ———, 3582 bls. unbleached sulphite.
Price & Pierce, Ltd., *Bockenheim*, ———, 2100 bls. unbleached sulphate.
Pagel Horton & Co., Inc., *Bockenheim*, Sweden, 2500 bls. wood pulp.
Gottesman & Co., Inc., *Bockenheim*, Sweden, 250 bls. wood pulp
Gottesman & Co., Inc., *W. A. McKenney*, Sweden, 500 bls. wood pulp
Price & Pierce, Ltd., *W. A. McKenney*, ———, 600 bls. unbleached sulphate.
Parsons & Whittemore, Inc., *Idarwald*, ———, 2112 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING MAY 29, 1937

Castle & Overton, Inc., *East Indiana*, Buenos Aires, 712 bls. rags.
Strawbridge & Clothier, *Vincent*, Havre, 2 cs. writing paper.
D. Bennedetto, Inc., *Vincent*, Havre, 154 bls. bagging.
E. J. Keller Co., Inc., *Vincent*, ———, 161 bls. rags.
E. J. Keller Co., Inc., *Skagerak*, ———, 200 bls. rags.
Keystone Wiper Supply Co., *Skagerak*, Kobe, 80 bls. rags.
Union Waste Co., *Skagerak*, Kobe, 50 bls. rags.

BALTIMORE IMPORTS

WEEK ENDING MAY 29, 1937

Hearst Consolidated Publications, Inc., *Muneric*, Quebec, 4265 rolls newsprint.
J. J. Ryan & Son, Inc., *Skagerak*, Kobe, 100 bls. cotton waste.
Congoleum Nairn Co., *Exermont*, Marseilles, 831 bls. rags.
Price & Pierce, Ltd., *Bockenheim*, ———, 2430 bls. mechanical pulp.
Price & Pierce, Ltd., *Bockenheim*, ———, 2928 bls. unbleached sulphite.
Price & Pierce, Ltd., *Bockenheim*, ——— 3192 bls. unbleached sulphate.
M. Sone, *City of Havre*, Hamburg, 372 bls. wood pulp.
M. Sone, *Bessa*, Sundsvall, 1500 bls. wood pulp.
Parsons & Whittemore, Inc., *City of Baltimore*, ———, 472 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING MAY 29, 1937

Price & Pierce, Ltd., *Gorm*, ———, 7056 bls. unbleached sulphite.
Gottesman & Co., Inc., *Gorm*, Sweden, 10,000 bls. wood pulp.

HOUSTON IMPORTS

WEEK ENDING MAY 29, 1937

Banco Coml. Italiane Trust Co., *Mongioia*, Genoa, 365 bls. bagging.

NEW ORLEANS IMPORTS

WEEK ENDING MAY 29, 1937

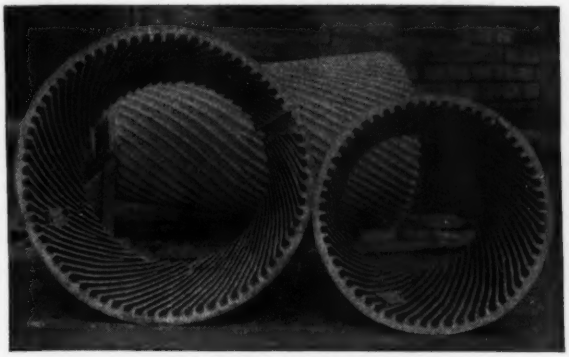
Continental Bank Trust Co., *Ida*, Trieste, 162 bls. rags.
Continental Bank Trust Co., *Ida*, Naples, 136 bls. rags.
M. Sone, *Syros*, Hamburg, 598 bls. wood pulp.
Parsons & Whittemore, Inc., *Syros*, ———, 333 bls. wood pulp.

MONTREAL IMPORTS

WEEK ENDING MAY 29, 1937

Pagel Horton & Co., Inc., *Truth*, Sweden, 25,791 bls. wood pulp.
Gottesman & Co., Inc., *Lagaholm*, Sweden, 11,625 bls. wood pulp.

REG. U.S. PAT. OFFICE "POSITIVE" TRADE MARK



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THE BAHR BROS. MFG. CO.

OUR SPECIALTY IS JORDAN FILLINGS

SPIRAL TYPE JORDAN FILLINGS
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THE OLD TYPE BAR JORDAN FILLINGS

Jordan fillings for every kind of stock, and for every known trade name and size Jordan. The bars, made of our stainless metal, resist the action of chemicals; also plain to meet the requirement in rough stock mills.

Place your refining problem up to us. Our high speed refiners are built for belt or V-belt drive; also for direct connected.

Your inquiries will have our prompt attention.

MARION, INDIANA, U. S. A.

HIGHEST GRADE

CLAYS

PAPER MAKERS IMPORTING CO. INC. WILLIAMSTOWN, PENNSYLVANIA, U.S.A.

COATING FILLING

POWDERED

EXCELSIOR FELTS

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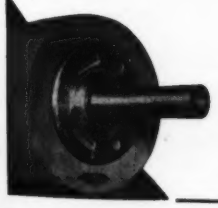
"Shaf-tites" for Paper Mills

No more loose shafts—in rolls of wood, rubber or metal. Patented head construction gives permanence.
Light in weight—Low in cost.



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We also make:

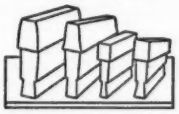
Water Turbines, Canal Gates
Variable Speed Drives
Endless Felt Washers
Tanks, Vats, Etc.

RODNEY HUNT MACH. CO.
38 Maple St., Orange, Mass.

WOOD COGS

OF ALL DESCRIPTIONS, BLANK OR FINISHED

From Thoroughly Seasoned New Hampshire Rock Maple



The Best Cog Stock in the World

THOMPSON MANUFACTURING CO.
Lancaster, - New Hampshire

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, June 2, 1937.

Conditions in the local paper industry during the past week were rather listless, as usual at this time of the year. The contract movement, however, is normal. Sales forces of the leading paper organizations continue optimistic. Prices are generally holding to schedule.

The newsprint paper industry continues to improve. Production in the United States, Canada and Newfoundland is being speeded up to take care of current consumption. Shipments against contract are proceeding in good volume. Observers of this market are generally confident of the future.

Trading in the fine paper market is fairly active. Demand for book, cover, bond and ledger papers is holding up well. Tissues are moving into consumption in good volume. The coarse paper market is strong with kraft specialties moving freely. The paper board market is softer.

Mechanical Pulp

The ground wood pulp market continues steady. Manufacturing operations in the United States, Canada and abroad are keyed to consumption as far as possible in order to meet current requirements. Contract shipments are moving as rapidly as possible. Prices are steady and unchanged.

Chemical Pulp

Steadiness again prevails in the chemical pulp market. Demand for bleached sulphite is fairly persistent. Recently advanced quotations on several of the grades are maintained, especially for the above item, and No. 1 kraft pulp. Bleached kraft pulp is also holding up well.

Old Rope and Bagging

The old rope market is slightly easier. Demand for domestic and imported old manila rope is moderately active. Small mixed rope is moving slowly. The bagging market is softer. Demand for both domestic and imported gunny and scrap bagging is less busy than of late.

Rags

Listlessness prevails in the domestic rag market for the time being. Demand for old rags has fallen off slightly and, with the exception of unbleached white muslins, is very slim. Roofing grades are only moderately active. The imported rag market is little changed with prices nominal.

Waste Paper

The better grades of paper stock are well maintained. Demand from the mills for shavings is excellent, especially for white envelope cuttings, ordinary hard white No's 1 and 2 and soft white No. 1. Book stock continues fairly steady and old kraft machine compressed bales are stronger.

Twine

Demand for twine is fairly satisfactory. Further varieties are in particular good request at present. Keen competition is due to the fact that prices are being held down although the outlook for the future is fairly promising.

Eastern Paper Distributors Meet

Representatives from nearly two hundred coarse paper merchants throughout the Eastern United States attended the first regular meeting of the Eastern States Paper and Bag Distributors Association, held at Pennsylvania Hotel, in New York on May 14. This Association, which had its inception at an organization meeting last February, is beginning to shape into one of the largest trade associations of its kind in the country.

The opening address was made by Charles Resnick, president of the association, who stated the purpose of this group was to eliminate the unethical trade practices now existing in the distribution of coarse paper products. Harry J. Dowd of Boston, Mass., chairman of the board of directors of the new association and its second vice-president, also spoke, pointing out that: "It is the object of members of this far flung association to cooperate with each other and with those manufacturers who cooperate with us."

In addition to the present officers which include Mr. Resnick and Mr. Dowd and Arthur H. Lewis of Philadelphia, executive secretary, the following were also elected to office: Fred W. Nader, Standard Paper Co., Lawrence, Mass., first vice-president; Harry Shapiro, Star Paper Company, Chester, Pa., treasurer.

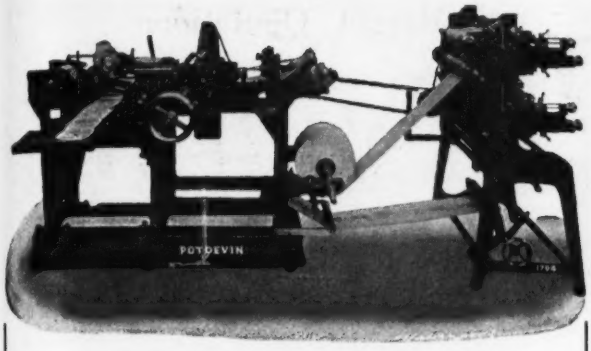
The Regional Board of Directors was augmented with the unanimous election of the following: Otto F. Hamilton, Hamilton Paper Company, Richmond, Va., and Otto P. Gronert, Baltimore, Md.

Exclusive of those already elected, the present members of the board of directors are: S. S. Rhoades, Standard Paper Company, Waterbury, Conn.; J. N. Freedman, S. Freedman & Sons, Washington, D. C., and Frank Dubin, Dubin Paper Company, Philadelphia, Pa.

Tentative By-laws of the association were adopted and the budget was set up.

The association's headquarters will continue to be in Philadelphia where larger quarters will be taken.

Arthur H. Lewis will continue as executive-secretary, and contacts will be made with merchants in many other states along the Eastern seaobard who have expressed very keen interest in the aims and purposes of the Eastern States Paper and Bag Distributors Association.



ANOTHER *HIGH-SPEED*
POTDEVIN COMBINATION

A POTDEVIN 2-color ANILINE web printing press plus a small POTDEVIN flat & square high-speed specialty bag machine—this combination gives the highest degree of satisfaction for manufacturing bags for ice-cream pops, peanuts, candy and small novelties.

These machines, which produce over 650 printed bags per minute, are in use all over the United States.

This unit may also be equipped with a 2-color oil-ink press, producing 4-color printed bags in one operation.

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SOLVAY
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IS *ALWAYS* STANDARD!

When a Company has maintained the most rigid of production standards over a period of 55 years . . . you can rely upon its name and on its products! Scientific methods . . . exacting supervision have made SOLVAY LIQUID CHLORINE a bleaching agent on which you can depend . . . that you can take for granted will be always pure, always uniform, when you receive it!

And when you place your order with Solvay for LIQUID CHLORINE . . . SODA ASH . . . CAUSTIC SODA . . . you are guaranteed fast, sure, on-time deliveries. You are relieved of worry, of check up . . . time spared for your own problems.

Write for full information and prices. Ask for free copy of 44-page book "SOLVAY LIQUID CHLORINE."

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"You can rely on it— if it's ZOPAQUE it's opaque!"

Yes... it's the most outstanding of all white fillers! ZOPAQUE is a *pure titanium dioxide*. Chemically pure and stable, it challenges comparison for *whiteness* and *opacity*.

AVAILABLE IN THREE GRADES:
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SD—LOW OIL

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THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY

CANTON, MASS.

Woolen manufacturers since 1856

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, June 2, 1937.

BLANC FIXE—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is now offered at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Conditions in the bleaching powder market are fairly satisfactory. The contract movement is normal and prices are generally maintained at formerly quoted levels. Bleaching powder is now offered at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The casein market is somewhat steadier. Domestic standard ground casein is quoted at from 13½ to 14 cents per pound; while domestic finely ground casein is selling at from 14 to 14½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA—Paper mill demand for caustic soda is firm. The contract movement is normal. Prices are steady. Solid caustic soda is quoted at from $2.55 to $2.60; while the flake and ground are selling at from $2.85 to $3 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market is displaying strength. Contract shipments are moving in good volume. Imported china clay is quoted at from $15 to $21 per ton, ship side; while domestic paper making clay is selling at from $6.50 to $12 per ton, at works.

CHLORINE—Paper mill demand for chlorine is holding up well. The contract movement is close up to average. Prices are generally maintained at formerly quoted levels. Chlorine is selling at from $2.15 to $2.25 per 100 pounds, in tank cars, at works.

ROSIN—The rosin market is little changed. Paper making gum rosin is now quoted at $8.30 and wood rosin at $8.50 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $3.70 per 100 pounds, in tank cars, at works.

SALT CAKE—Demand for salt cake is persistent. Prices are steady and unchanged. Salt cake is quoted at from $12 to $13; chrome salt cake at from $11 to $12 per ton, at works; while imported salt cake is selling at from $12 to $13 per ton, ship side.

SODA ASH—The soda ash market is fairly active. Paper mill demand is persistent. Prices are holding to formerly quoted levels. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH—Trading in the starch market is moderately active. The contract movement is seasonal. Prices are holding to schedule. Special paper making starch is now quoted at $4 per 100 pounds, in bags; and at $4.27 per 100 pounds, in barrels, at works.

SULPHITE OF ALUMINA—The sulphite of alumina market is irregular. Contract shipments are moving freely. Commercial grades are quoted at from $1.25 to $1.60; while iron free is selling at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The sulphur market is steady. Yearly contracts are quoted at $18 per long ton on orders of 1,000 tons, or over and $20 on smaller quantities. On spot and nearby car loads the quotations are $21 per ton. All quotations are in car lots, at works.

TALC—Offerings of talc are moving into consumption in fair volume. In most instances, prices are holding to schedule. Domestic talc is still quoted at from $15 to $18 per ton, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

Tissues—Per Ream—

White No. 1	.95	@	—
White No. 1 M. G.	.92½	@	—
White No. 1½	.67½	@	—
White No. 2	.62½	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.62½	@	—
Unbleached Toilet.	2.60	@	3.30
Bleached Toilet	3.94	@	5.26

Paper Towels—

Unbleached	2.10	@	3.35
Bleached	3.30	@	3.70

Manila—

No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00

Fibre Papers—

No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75

(Delivered New York)

News, per ton—

Roll, contract	42.50	@	—
Sheets	47.50	@	—

Kraft—

No. 1 Northern	5.25	@	5.75
Standard	5.00	@	—
Southern	5.00	@	—
Glazed	4.50	@	—
Striped	4.75	@	—

Boards, per ton—

News	47.50	@50.00
Chip	45.00	@47.50
Sgl. Mla. Li. Chip.	55.00	@60.00
Jute Lined Chip	55.00	@60.00
Kraft Liners	65.00	@67.50
White Pat. Coated.	67.50	@70.00
Binders Boards	70.00	@75.00

The following are distributors' resale prices:—

Rag Content Bonds and Ledgers—

16-Carton Quantities, White, Assorted Items

Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1.	$43.20	$44.40
100% Rag	34.20	35.40
85% Rag	—	33.60
75% Rag	25.80	27.00
65% Rag	23.15	24.40
50% Rag	20.00	21.25
25% Rag	16.90	18.15

Regular colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra.

Sulphite Bonds and Ledgers—

16-Carton Quantities, White, Assorted Items

Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.00	$11.25
No. 2	9.05	10.30
No. 4	8.15	9.40

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra.

Free Sheet Book Papers—

4-Case Quantities, White, Case Assortment

Delivered in Zone 1:

No. 1 Glossy Coated	$13.65
No. 2 Glossy Coated	11.90
No. 3 Glossy Coated	10.65
No. 1 Antique (watermarked)	10.00
No. 2 Offset	9.25
A Grade E. F.	9.05
A Grade Super	9.30
B Grade E. F.	8.45
B Grade Super	8.70
C Grade E. F.	8.15
C Grade Super	8.40
D Grade E. F.	7.80
D Grade Super	8.05

Ivory & India @ $.50 cwt. extra.

Add 60 cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—

Moist	33.00	@36.00
Dry	40.00	@42.00

(Delivered)

No. 1 Domestic and Canadian	33.00	@36.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—

Prime Bleached Sulphite	3.25	@	4.65
Prime Qualities—Easy-Bleaching Sulphite	3.50	@	3.75
Strong Unbleached Sulphite	3.40	@	3.65

(On Dock, Atlantic Ports)

Kraft Bleached	3.50	@	4.50
Kraft Light & Strong	2.75	@	3.75
Kraft No. 1	2.60	@	3.50
Kraft No. 2	2.50	@	2.75

(F.o.b. Pulp Mill)

Kraft Domestic	2.50	@	3.25

(Delivered)

Soda Bleached	2.90	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—New White, No. 1	9.00	@	9.25
Silesias, No. 1	6.75	@	7.00
New Unbleached	9.25	@	9.50
Blue Overall	7.50	@	8.00
Fancy	4.00	@	4.50
Washables	3.00	@	3.50
Mixed Khaki Cuttings	4.25	@	4.50
O. D. Khaki Cuttings	4.75	@	5.00

Old Rags

White, No. 1—Repacked	3.50	@	3.75
Miscellaneous	3.00	@	3.25
White, No. 2—Repacked	2.50	@	2.75
Miscellaneous	2.00	@	2.25
Thirds and Blues—Repacked	2.00	@	2.25
Miscellaneous	1.90	@	2.00

Roofing Rags—

No. 1	Nominal		
No. 2	1.35		1.45
No. 3 (bagging)	1.20	@	1.30
No. 4	1.20	@	1.30
No. 5A	1.05	@	1.10

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.50
New Mixed Cuttings	2.00	@	2.25
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxfords	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00

WHY NOT

REDUCE YOUR FOURDRINIER WIRE COSTS BY USING A WIRE THAT WILL GIVE YOU ALL AROUND SERVICE.

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A WIRE WITH A NON-CRACK PATENTED SELVIDGE

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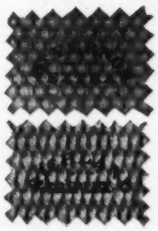
ARE AS GOOD AS THE BEST.

PURVES MACHINE WIRE COMPANY, INC.
HOLYOKE, MASSACHUSETTS

TESTED



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and Rotary Screens,
Pulp Washers, Drainer
Bottoms, Filter Plates, etc.

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Metanil Yellow MXXX CONC

Of all the Acid Yellows, Metanil Yellow MXXX Conc. is tinctorially the strongest. It is outstanding for both beater dyeing and calender staining because of its excellent solubility. Because of unusual alkali fastness it finds general usage throughout the container board trade. Its principal uses are as follows:—liner board, container board and poster. Ask for a sample today.

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DIVISION OF THE CALCO CHEMICAL CO., INC.
90 West Street, New York, N. Y.
A DIVISION OF AMERICAN CYANAMID COMPANY
BOSTON—35 Hartford St. • CHICAGO—146 W. Kinzie St.
SPRINGFIELD, MASS.—40 Albert St.
PHILADELPHIA —401 No. Broad St.
Factories: BOUND BROOK, N. J. and NEWARK, N. J.

No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	2.25	@	2.50
French Blue Linens	3.50	@	4.00
German Blue Linens	2.50	@	2.75
German Blue Cottons	2.00	@	2.25
Checks and Blues	2.00	@	2.25
Linsey Garments	2.25	@	2.35
Dark Cottons	2.15	@	2.25
Old Shopperies	1.75	@	2.00
New Shopperies	1.75	@	2.00
French Blues	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.25	@	2.35
Domestic	2.15	@	2.25
Wool Tares, light	1.75	@	1.85
Wool Tares, heavy	2.20	@	2.35
Bright Bagging	1.70	@	1.75
Manila Rope—			
Foreign	5.00	@	5.25
Domestic	5.25	@	5.50
Jute Strings	2.75	@	3.00
Sisal Strings	2.60	@	2.75
Mixed Strings	Nominal		

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.25	@	3.50
Ordinary Hard White No. 1	2.60	@	2.70
Hard White No. 2	2.50	@	2.60
Soft White No. 1	2.40	@	2.50
Flat Stock—			
Stitchless	1.45	@	1.55
Overissue Mag	1.45	@	1.55
Solid Flat Book	1.40	@	1.45
Crumbled No. 1	1.20	@	1.25
Ledger Stock	1.30	@	1.35
New B. B. Chips	.65	@	.70
Manila—			
New Env. Cut	2.25	@	2.35
New Cuttings	1.90	@	2.10
Old Kraft Machine—			
Compressed bales	1.80	@	1.90
News—			
No. 1 White News	1.50	@	1.60
Strictly Overissue	.90	@	1.00
Strictly Folded	.60	@	.75
No. 1 Mixed Paper	.50	@	.70

Twines

(F. o. b. Mill)

(Soft Fibre)			
Coarse Polished—			
India	.16	@	.18½
Belg. White Hemp	.17	@	.20½
India Compress	.16½	@	.17
Fine Polished—			
Fine India	.22	@	.24
Unpolished—			
Box	.11¾	@	.12¼
Paper Makers	.11½	@	.13¾
Tube Rope	.12½	@	.15¼
Wall Paper	.13½	@	.14¼
Wrapping	.17	@	.21
Soft Fiber Rope	.14¾	@	.15¼
(Hard Fibre)			
Bond	.13½	@	.22
Anchor	.13	@	.14½
Manila	.21	@	.28

Domestic	5.00	@	5.30
Transmission Rope	2.00	@	2.25
Jute Rope	2.50	@	2.75
Soft Jute Strings	2.75	@	3.00
Jute Carpet Threads	1.75	@	2.00
Gunny No. 1—			
Foreign	2.50	@	2.60
Domestic	2.10	@	2.15
Bleachery Burlap	4.25	@	4.50
Scrap Burlap—			
Foreign	2.15	@	2.25
Domestic	1.90	@	2.10
Scrap Sisal	2.60	@	2.75
Scrap Sisal for Shredding	2.75	@	3.00
Wool Tares, heavy	2.40	@	2.60
New Burlap Cuttings	2.15	@	3.00
Aust. Wool Pouches	3.25	@	3.30
Heavy Baling Bagging	2.40	@	2.60
Paper Mill Bagging	1.75	@	1.80
Bagging No. 2	1.70	@	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04	@	.04¼
New White No. 1	.09	@	.09¼
New White No. 2	.06¾	@	.07
New Light Flannelettes	.07½	@	—
Silesias No. 1	.07¾	@	.08
New Black Silesias	.04¼	@	.04½
Soft Unbleached	.09½	@	.09¾
Blue Cheviot	.07½	@	.07¾
Fancy	.03¾	@	.04
Washable	.03	@	.03¼
Kraft, M. F.	6.00	@	—

Cottons—According to grades—			
Blue Overalls	.07½	@	.07¾
New Black, soft	.04¼	@	.04½
Khaki Cuttings	.04¾	@	.05
O. D. Khaki	.05	@	.05¼
Corduroy	.03¼	@	.03½
New Canvas	.07¾	@	.08¼
B.V.D. Cuttings	.08¾	@	.09

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.35	@	1.45
No. 2	1.35	@	1.40
No. 3	1.05	@	1.15

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.90	@	2.00
Dutch Blues	3.00	@	3.15
New Checks and Blues	2.85	@	3.00
Old Fustians	2.85	@	3.00
Old Linsey Garments	2.50	@	2.65
New Silesias	6.50	@	7.00

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.08	@	.08½
New White, No. 2	.04½	@	.05
Light Silesias	.05½	@	—
Silesias, No. 1	.04½	@	.05
Black Silesias, soft	.03½	@	.04
New Unbleached	.06	@	—
Washable, No. 1	.02	@	.02½
Blue Overall	.07	@	.07½
Cottons—According to grades—			
Washable, No. 2	.02½	@	.04½
New Blue	.02	@	.02½
Fancy	.03	@	—
New Black Soft	.04	@	.04½
New Light Seconds	.03½	@	.04
New Dark Seconds	2.00	@	2.25
Khaki Cuttings—			
No. 1 O. D.	.04	@	.04½
No. 2 Mixed	.03½	@	.04
Corduroy	.02	@	.02¼
New Canvas	.04	@	.04½
New Black Mixed	.02	@	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	4.00	@	4.50
Miscellaneous	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	2.00	@	2.25
Repacked	2.50	@	2.75
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1	2.20	@	2.25
Domestic No. 1	2.00	@	2.10
Domestic No. 2	1.90	@	2.00
Roofing Bagging	1.75	@	—

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	2.00	@	—
Domestic	2.25	@	—
Manila Rope	4.50	@	—
Sisal Rope	3.00	@	—
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	2.25	@	2.50
No. 2	1.00	@	1.10
Wool Tares, heavy	3.25	@	3.50
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.50	@	2.75

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	—	@	2.60
No. 2 Hard White	2.20	@	2.25
No. 1 Soft White	2.00	@	2.10
No. 2 Soft White	1.75	@	—
No. 1 Mixed	—	@	.85
Solid Ledger Stock	—	@	1.75
Ledger Stock, white	1.75	@	—
Ledger Stock, colored	1.50	@	—
No. 1 Books, heavy	1.20	@	1.25
Manila Cuttings	1.80	@	1.90
Print Manila	.75	@	.85
Container Manila	.80	@	—
Kraft Paper	1.75	@	—
No. 1 Mixed Paper	.60	@	.65
Straw Board Chip	.50	@	—
Binders Board Chip	.50	@	—
Corrugated Board	.70	@	.80
Overissue News	.75	@	.80
Old Newspapers	.60	@	.65

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.20	@	2.35
No. 1 Soft White	1.85	@	2.15
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	1.40	@	—
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.60	@	1.70
Manila Env. Cuttings, extra quality	2.20	@	2.30
No. 1 Old Manila	.95	@	1.00
White Blank News	1.30	@	1.40
No. 1 Kraft	1.90	@	2.00
Mixed Papers	.60	@	.65
Print Manila	.75	@	.85
Container Manilas	.27½	@	—
Old Newspapers	.60	@	.65
Overissue News	.50	@	.65
Box Board Chips	.55	@	.60
Corrugated Boxes	.85	@	.90
Kraft corrugated boxes	1.60	@	1.65
Screening Wrappers	.60	@	.65

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	4.75	@	5.00

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	3.30	@	3.40
No. 1 Hard White	2.60	@	2.70
No. 1 Soft White	2.10	@	2.15
Ledger & Writings	1.40	@	1.50
Solid Books	1.25	@	1.30
Blanks	1.50	@	1.60
Krafts	1.00	@	1.25
New Kraft Cuts	1.80	@	2.00
Manila Env. Cuts	2.20	@	2.35
Ex. No. 1 Manila	2.20	@	2.35
Print Manila	1.70	@	1.80
Overissue News	.80	@	.90
Old Newspapers—			
No. 1 Folded News	.80	@	.90
No. 1 Mixed Paper	.80	@	.90
Roofing Stocks—			
No. 1	2.00	@	2.25
No. 2	1.85	@	2.00

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.35½	@	—
No. 1 Tints	.36½	@	—
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	.15	@	—
No. 4 Tints	.16	@	—
No. 5 Bond—White	.11	@	—
No. 5 Bond—Tints	.12	@	—
No. 5 Bond—Golden Rod	.13	@	—
No. 5 Ledger—White	.11½	@	—
No. 5 Ledger—Tints	.12	@	—
No. 6 Bond—White	.10½	@	—
No. 6 Bond—Tints	.11	@	—
No. 6 Bond—Golden Rod	.12½	@	—
No. 7 Bond—White	.08¾	@	—
No. 7 Bond—Tints	.09¼	@	—
No. 7 Bond—Golden Rod	.10¾	@	—
Book—			
No. 1 M. F.	6.75	@	7.00
No. 2 M. F.	6.50	@	6.75
No. 3 M. F.	5.25	@	5.75
No. 1 S. C.	7.25	@	7.50
No. 2 S. C.	6.75	@	7.00
No. 3 S. C.	5.75	@	6.00
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.85	@	—
White Wrap	4.00	@	—
"B" Manila	4.90	@	—
No. 1 Manila	5.50	@	—
Fiber	5.50	@	—
Kraft, No. 2	5.50	@	—

(F. o. b. Cars, Toronto)

News, per ton—			
Rolls (contract)	38.50	@	—
Sheets	45.50	@	—

Pulp

Ground wood	30.00	@	31.00
Unbleached Sulphite	52.00	@	53.00
Book (Class 1)	65.00	@	66.00
Writing (Class 2)	66.00	@	67.00
Select (Class 3)	67.00	@	68.00

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.50	@	—
Soft White	2.15	@	—
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.00	@	—
Light and Crumpled Book Stock	1.15	@	—
Ledgers and Writings	1.20	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.55	@	—
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.75	@	—
Strictly Folded	.80	@	—
No. 1 Mixed Paper	.65	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09	@	.09¼
Fancy Shirt Cuttings	.03¼	@	.04